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# Journal OF THE AMERICAN DIETETIC ASSOCIATION

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*Ruth M. Griswold*, Ph.D.

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V. Physical Findings
*Norman S. Moore*, M.D., *and Charles R. Shaw*, M.D.

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VII. Employee Training—A Part of Personnel Management

The Professional Growth of the Dietetic Intern

Food Problems of Civil Defense

***34th A.D.A. Annual Meeting, Cleveland, October 9-12, 1951***

*Published by* THE AMERICAN DIETETIC ASSOCIATION

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HARVARD BEETS

**1 #2 can beets (about 2¼ cups)**
**6 SUCARYL tablets**
**¼ cup water**
**1 tablespoon cornstarch**
**½ teaspoon salt**
**¼ cup cider vinegar (5% acidity**

Dice or slice beets. Mash SUCARYL tablets and dissolve in water. Combine cornstarch, salt, vinegar and dissolved SUCARYL tablets; cook over low heat until thickened, stirring constantly. Add beets, heat until beets are hot. (If desired, 2 tablespoons butter or margarine may be added with beets.) Makes 4 servings. Each serving contains: protein, 0.8 Gm.; fat, 0; carbohydrate, 11 Gm.; calories, 47. Would contain 146 calories if made with sugar. *Calories saved:* 99.

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# Effect of Heat on the Nutritive Value of Proteins[1]

RUTH M. GRISWOLD, Ph.D.

*Department of Home Economics University of Chicago*

RECENT emphasis on the protein content of diets has made a consideration of the effect of heat on the nutritive value of the protein in certain important foods timely. It will be seen in the review which follows that information on this subject has accumulated over a long period, but is still incomplete. Perhaps a thorough understanding of the changes that heat causes in proteins must wait until the chemistry of protein molecules is known in more detail. The investigations reported here show that heat sometimes has a beneficial, sometimes a harmful effect on the nutritive value of proteins.

## SOYBEANS

In 1917, Osborne and Mendel (1) observed that rats grow well when fed cooked soybeans as their sole source of protein, but make little growth on raw soybeans. This observation has been confirmed by other workers and has been extended to include pigs (2–4) and chicks (5–7). While no growth studies have been done on human beings, the nitrogen retentions of two adults fed enough soybean flour to furnish 75 per cent of the protein of the diet was about 20 per cent greater with autoclaved than with raw soybean flour (8). Both flours supported positive nitrogen balance and were absorbed equally well from the intestine, as shown by similar fecal nitrogen excretions.

The search for an adequate explanation of the improvement in the nutritive value of the protein of soybeans on cooking has been extensive and is probably not yet complete. The first suggestion was made by Osborne and Mendel (1), who said that cooking soybean meal probably made it more palatable for the rats. Experimental evidence then accumulated from several laboratories in the form of nitrogen balance studies on rats, for which the methods of Mitchell and co-workers (9–12) have been widely used. One such study, by Hayward, Steenbock, and Bohstedt (13), showed that heating raw soybeans during the manufacture of commercial soybean oil meals increased their digestibility[2] 3 per cent and their biologic value[3] 12 per cent. In other words, heating caused a slight increase in the protein absorbed from the gastrointestinal tract and a considerable increase in the amount retained by the body.

### *Cystine and Methionine Deficiencies*

A deficiency of cystine in the protein of raw soybeans was noted by Mitchell and Smuts (14). Later, Hayward, Steenbock, and Bohstedt (15) found that the addition of cystine or casein improved the growth of rats fed raw soybeans, but not of those fed cooked beans, and expressed the belief that cystine in the raw protein may exist in a form unavailable to the animal, becoming available on heating. The implication of the sulphur-containing amino acid cystine in the soybean problem suggested a study of the sulphur balance of rats which was carried out by the Wisconsin group (16). These workers found that while rats absorbed about the same amount of sulphur whether fed heated or raw soybeans, they retained approximately 2.5 times as much sulphur and 1.8 times as much nitrogen on heated as on raw soybeans. The authors concluded that soybeans contain a sulphur- and nitrogen-containing complex which is absorbable but cannot be used for building tissue until after heating. Similar difficulty in liberating cystine from raw soybean protein has been experienced *in vitro*. Jones (17) observed that raw soybean protein is less digestible by trypsin than is the cooked protein and that a disproportionate amount of the cystine is tied up in fractions largely

[1] Received for publication August 12, 1950.

[2] Percentage digestibility is:

$$\frac{\text{food N} - (\text{fecal N} - \text{metabolic N})}{\text{food N}} \times 100,$$

where metabolic nitrogen is fecal nitrogen on a nitrogen-free diet.

[3] Biologic value, or percentage of absorbed protein that is retained, equals:

$$\frac{\text{food N} - (\text{fecal N} - \text{metabolic N}) - (\text{urinary N} - \text{endogenous N})}{\text{food N} - (\text{fecal N} - \text{metabolic N})} \times 100,$$

where endogenous nitrogen is total urinary nitrogen on a nitrogen-free diet.

resistant to digestion. He found that cystine was liberated less readily from raw or cooked soybean protein by either tryptic digestion or acid hydrolysis than from other proteins studied.

Methionine, another sulphur-containing amino acid, has been found (18) to be even more effective than cystine in supplementing the protein of raw soybeans. This would be expected from the fact that methionine is an essential amino acid which can replace cystine in the diet but which cannot be replaced by cystine. In contrast to the earlier workers (15), Hayward and Hafner (18) found that protein quality could be improved for rats and chicks by adding cystine or methionine to autoclaved as well as to raw soybeans. It is evident, therefore, that heated soybean protein is slightly deficient in methionine, while raw soybean protein is definitely deficient in this amino acid (19). However, the addition of adequate amounts of methionine to raw soybean meal does not make its growth-promoting qualities equal to those of similarly supplemented autoclaved meal (20), showing that other factors are involved. The cystine-methionine deficiency of soybeans evident in work with rats would undoubtedly be less serious in human nutrition, since rats require more of the sulphur-containing amino acids for hair growth than do human beings (21, 22).

### *Presence of a Trypsin Inhibitor*

The next evidence helping to explain the low biologic value of raw compared with cooked soybeans was offered independently in 1944 by Ham and Sandstedt (23) and by Bowman (24). These investigators prepared aqueous extracts of soybeans which inhibited the digestion *in vitro* of protein by trypsin, and which were inactivated by heating. Indeed, Bowman (25–27) has suggested that soybeans contain several anti-tryptic factors differing in solubility and precipitation properties. Kunitz (28–30) has isolated and crystallized a trypsin inhibitor from soybeans which proved to be a protein of the globulin type. He has also isolated a crystalline protein compound consisting of trypsin and the trypsin inhibitor (31). The inhibitor does not affect the action of pepsin or of papain.

As soon as the presence of the inhibitor was established, the question as to its mode of action arose. The most obvious answer was that intestinal hydrolysis of soybean protein was incomplete in the presence of the inhibitor. Evidence for this belief was presented by Ham, Sandstedt, and Mussehl (32), who fed raw soybean meal to chicks and washed out part of the intestinal contents after sacrificing the animals. They found that the proteolytic activity of these intestinal contents on a 5 per cent casein substrate was less than that of similar material from control animals given autoclaved soybean meal. They suggested that inhibition of the hydrolysis of a protein containing a suboptimal level of certain amino acids would precipitate a deficiency of these amino acids and, therefore, limit growth. Since the methionine level of heated soybean protein is suboptimal, inhibition of hydrolysis would explain the greater methionine deficiency of raw compared with autoclaved soybean meal. *In vitro* experimental evidence for this theory was furnished by Melnick *et al.* (33, 34), who found that methionine is released more rapidly from heat-processed than from raw soybean meal. These investigators believe that it is the rate rather than the extent of liberation of methionine which determines the biologic value of soy protein.

If the poor biologic value of raw soybeans is due to incomplete or slow release of certain essential amino acids from the protein, hydrolysis of raw soy protein before feeding would be expected to improve its biologic value. This expectation was borne out by McGinnis and Menzies (35), who found that papain digestion of raw soybean flakes increased their nutritive value for chicks as much as autoclaving, while similar digestion of the autoclaved soybean flakes gave only slightly better growth than autoclaving alone. These authors suggest that the fraction of raw soybeans responsible for their poor nutritive value may be inactivated by *in vitro* papain digestion as well as by heating. Further work from the same laboratory (36) indicates that autoclaved soybean oil meals were more completely digested by the chicks, and *in vitro* by trypsin and erepsin, than the raw meal.

Further *in vitro* evidence concerning the inhibitor was furnished by Riesen *et al.* (37), who determined the proteolytic action on casein of mixtures of pancreatin and soybean oil meals. The proteolytic activity, or active enzyme concentration, of the mixture containing raw soybean oil meal was considerably lower than for meals which had been autoclaved 4 min. or 4 hr., apparently due to the effect of the trypsin inhibitor on pancreatin. In contrast to Melnick, Oser, and Weiss (33), these investigators found that heat treatment affected the enzymatic liberation of each amino acid similarly, having no more effect on the liberation of methionine than on the other amino acids. Similar results were obtained by Liener *et al.* (20), who found that the trypsin inhibitor exerts an effect through a mechanism unrelated to the availability and utilization of methionine.

Approaching the problem from a different standpoint, Westfall and Hauge (38) used a quantitative method for determining the potency of the trypsin inhibitor. They found that the protein efficiency of soybean flour increased in direct proportion to the destruction by heat of the potency of its trypsin inhibitor. They checked their results by addition of the inhibitor to autoclaved soybean flour and to soybean protein and concluded that the trypsin inhibitor was the chief cause of poor utilization of the protein of inadequately heated soybean flours.

The presence of a growth inhibitor in soybeans was

suggested by Klose, Hill, and Fevold (39) and confirmed by Desikachar and De (40). The latter investigators studied raw soybean meal digested with papain and a control sample "digested" with papain inactivated by boiling. Since in this case the hydrolyzed sample was not superior in digestibility or biologic value to the unhydrolyzed sample, the authors concluded that raw soybeans contain an antigrowth factor. Further evidence for this view was contributed by Westfall, Bosshardt, and Barnes (41) who found that the addition of the inhibitor fraction of raw soybeans to either casein or a casein hydrolysate caused a decrease in growth rate and protein utilization. Autoclaving abolished the harmful effects of the extract. They point out that there are many possibilities of indirect mechanisms whereby an inhibitor of proteolytic activity could exert a deleterious effect in the intestinal tract or in the animal body aside from the inhibition of tryptic digestion of protein within the intestinal tract.

It seems possible that soybeans contain at least three trypsin inhibitors (27, 42) having different physiologic effects. The evidence cited indicates that growth and digestion by trypsin are both affected by the trypsin inhibitors. This two-fold action by preparations of trypsin inhibitor is discussed by Liener, Deuel, and Fevold (43), who point out that the anti-proteolytic effect is demonstrated when an intact protein critically deficient in methionine is fed, while the growth-inhibiting effect is independent of the nature and quality of ingested nitrogen.

A recent report by Richardson and Blaylock (44) indicates that the results of some of the earlier work might have been different had vitamin $B_{12}$ been included in the experimental diets. These workers found that soybean oil meal as the sole source of protein supported normal growth in chicks when it was supplemented with a vitamin $B_{12}$ concentrate. However, Schultze (45) found that adding vitamin $B_{12}$ did not increase the already satisfactory weight gains of rats fed a purified soybean protein preparation supplemented with methionine.

### *Effect of Excessive Heat*

The evidence already given has demonstrated the beneficial effects of mild heat on the nutritive value of soybean protein. Such beneficial heat treatments include boiling the beans (46–48), roasting 30 min. at 149°C. (46), or brief, mild autoclaving. However, excessive heat, such as autoclaving above 120°C., has a harmful effect on the nutritive value of soybean protein (49–51). Evidently drastic autoclaving decreases the availability to the animal organism of certain amino acids, since the nutritive value of overheated soybeans is improved by the addition of lysine (50), and restored by additions of methionine and lysine (52), or of methionine, cystine, and lysine (53). It has also been suggested that excessive heating of soybeans results in a leucine deficiency (54).

Since it seemed possible that the decreased availability of the amino acids was due to the formation of a product not readily attacked by enzymes, *in vitro* digestion techniques were used. It was found (36, 55) that soybean meal which had been autoclaved at temperatures above 120°C. was less readily digested by the enzymes tested than meal autoclaved at lower temperatures. Using microbiologic methods for the determination of individual amino acids, workers of the Wisconsin group (37) found that excessive heat treatment decreased the liberation by pancreatic hydrolysis of each of the essential amino acids in a similar manner. However, similar heat treatment decreased the liberation by acid of lysine, arginine, and tryptophan but did not affect the release of the other essential amino acids. These three amino acids, each of which contains a nitrogen group not involved in the peptide linkage, are also inactivated when casein is heated under reflux in 5 per cent glucose solution (56). It has been suggested that in both cases condensation occurs between the aldehyde group of sugar and a free nitrogen group of an amino acid. The nitrogen group may be furnished by any free amino acid, or in proteins by a nitrogen group not used for a peptide linkage. This reaction, called the Maillard reaction, probably represents the first step in the non-enzymatic browning which occurs during the processing of many foods.

Evidence that the reducing sugars which soybeans contain (57) react with free amino groups was furnished by Evans and Butts (58) who found that 40 per cent of the lysine of soybean oil meal was destroyed by autoclaving 4 hr., while soy protein alone, when autoclaved, showed little loss of lysine. Soy globulin, when heated under reflux in 5 per cent glucose solution, yielded less lysine, arginine tryptophan, and histidine on hydrolysis than when the protein was heated under reflux 24 hr. in water (59). However, boiling whole soybeans in water for 12 hr. did not decrease enzymic liberation of the amino acids (48). Evidence (60, 61) indicates that the sulphur-containing amino acids, cystine and methionine, may also, during prolonged autoclaving, form linkages resistant to enzymatic hydrolysis.

## OTHER LEGUMES

As with soybeans, the nutritive value of the protein of many varieties of beans is improved by cooking. This is true of navy beans (62, 63), Lima beans (64), Chinese and Georgia velvet beans (65), lentils (66), kidney and pinto beans (67). In many cases, the nutritive value o the heated beans is further improved by the addition of cystine (62, 64, 66) or methionine (68–70). The poor growth of animals fed raw beans is evidently due, at least in part, to the presence of a trypsin inhibitor similar to that of soybeans. Its occurrence has been studied by Bowman (71) and by Borchers and Ackerson (72).

However, the presence of the inhibitor evidently does not offer a complete explanation of the poor nutritive value of certain legumes, since Borchers and Ackerson (73) observed no correlation between the effect of autoclaving on nutritive value and the presence or absence of the trypsin inhibitor in the raw legume seed. The trypsin inhibitor of navy beans is different from, and more active than, that of soybeans (74). Since the inhibitor of Lima beans has at least as much growth-depressing effect when fed with hydrolyzed casein as with unhydrolyzed casein (75), inhibition of enzymatic digestion is probably not the principal factor involved in its action (76). The addition of methionine almost completely counteracted the growth-depressing effect of the Lima bean inhibitor (76).

In contrast to beans, the nutritive value of the protein of most varieties of peas is not improved by cooking (67, 69, 77). Indeed, the growth-promoting properties of the protein of Alaska field peas are decreased by baking, autoclaving, or canning (78, 79), and the protein is not as easily digested by enzymes *in vitro* after heating as when raw (80). Autoclaving seems to destroy part of the cystine and lysine of the Alaska peas (80). This variety of peas is used for canning when immature and for split peas when mature.

The protein of peanuts behaves more like that of peas than like that of beans. Its digestibility *in vitro* is not appreciably increased by boiling or autoclaving (81). Moderate heat treatment, either by moist heat or roasting, does not alter significantly the nutritive value of peanut proteins, but overroasting makes the proteins essentially worthless for growth production (82). Growth on the overheated peanuts can be improved by the addition of lysine.

### EGGS

Vernon (83) found, in 1904, that egg albumin has a marked anti-tryptic action presumably due to its combination with trypsin molecules. This anti-tryptic action was lost on heating the albumin at 100°C. Later work has shown that it is not lost during the commercial drying of egg white (84, 85). It will be noted that the presence of a trypsin inhibitor was recognized in egg white long before a similar agent was found in soybeans.

In 1947, Lineweaver and Murray (86) identified the trypsin inhibitor of egg white with ovomucoid, a long-recognized protein of eggs. This protein was added to the diet of humans (87) to see whether the anti-proteolytic action it shows *in vitro* has a significant effect in metabolism. Evidently it does not, since there were only minor differences in the amounts of nitrogen absorbed during consecutive periods in which lactalbumin, unheated egg white powder, heated egg white powder, or heated egg white powder plus ovomucoid furnished 40 per cent of the protein intake.

The protein of egg yolk is well utilized when raw or cooked (88) and contains only about 0.4 per cent as much anti-tryptic activity, on a dry weight basis, as does the white (86).

### MEAT

Some of the earliest work on raw and cooked beef indicates that home cooking methods have little effect on its nutritive value (89–93). However, other investigators (94, 95) found the digestibility of thoroughly cooked or autoclaved meat to be lower than that of raw meat. Most of the recent work has confirmed the observation that heat decreases the nutritive value of meat proteins, the effect being greater for more drastic heat treatments. Thus, Morgan and Kern (96) found that raw beef had greater biologic value than boiled beef, while boiled beef was superior to that autoclaved 1 hr. at 15 lb. pressure. As would be expected, canning lowered the nutritive value of meat more than did home cooking methods or corning (97, 98). Mitchell, Hamilton, and Beadles (99) reported that roasting beef round did not damage its protein. Undoubtedly some of the early work in which no change of nutritive value on heating was reported used cooking methods later shown to have no effect, or only a slight effect on nutritive value.

In order to exaggerate the results, the effects of excessive heat treatment on the nutritive value of meat protein has been tested. Mattill and his group (100–102) have used this approach. They found (100) that heating dried beef liver at 129°C. for 72 hr., or extracting it with hot alcohol for 130 hr., markedly lowered its digestibility for rats. Evidently heating had made the amino acids resistant to the digestive enzymes, since the acid hydrolysates of heated or alcohol-extracted samples gave approximately the same growth as those of carefully dried beef liver. Further work (102) by the same group indicated that hot alcohol extraction of liver and kidney globulins decreased the amount of free amino nitrogen, but not of total nitrogen. It seemed probable that new enzyme-resistant configurations of the amino acids were formed during heating. This view was confirmed by Beuk, Chornock, and Rice (103) using raw and cured pork autoclaved at 112°C. for 24 hr. The drastically autoclaved sample showed complete retention of all amino acids tested, except cystine, on acid or alkaline hydrolysis. However, when enzymes were used for hydrolysis, the apparent retentions of amino acids were only 27 to 65 per cent. The decreases in enzyme digestibility of severely autoclaved pork indicate that the milder processes of home or commercial cooking may also decrease digestibility, but that the changes may not be detectable under normal conditions. They later reported (104) that increasing the autoclaving from 5 min. to 24 hr. caused a progressive decrease in the digestibility of pork by trypsin and erepsin, and suggested that unavailable peptides are formed during heating.

Several studies (105–111) have been made of the amino acid retention of meat cooked or canned by the usual methods. The evidence indicates that such methods do not change materially the essential amino acid composition of the meat.

### MILK

The purified protein casein has been studied with special care, probably because of its frequent use in experimental rat diets. In 1917, McCollum and Davis (112) found that heating casein 1 hr. at 15 lb. pressure destroyed its biologic value as a complete protein and showed that this was not due to the development of toxicity. Seventeen years later, Block and his co-workers (113) found that the proportion of lysine yielded by acid hydrolysis was not affected by heat treatment of casein, but suggested that heat may have caused a molecular rearrangement that made the lysine precursors resistant to enzymatic degradation. In the same year, Greaves and Morgan (114) reported that additions of lysine and histidine increased the food value of heated casein, without affecting that of raw casein. Tryptophan and tyrosine were without supplementary value, while cystine improved the growth of rats on both raw and heated casein. A later paper (115) from the same laboratory indicated that lysine is the first amino acid damaged when casein is overheated, histidine the second. Cystine, tyrosine, and tryptophan were not affected by the treatment used.

The discovery that the heat damage of casein is due in part to damage of the lysine was followed by *in vitro* studies of the liberation of amino acids by enzymes from casein. Such studies (116) showed that crude pancreas, or crystalline pepsin, trypsin, and chymotrypsin did not liberate as much lysine from heated as from raw casein. Pader, Melnick, and Oser (117) have suggested that lysine is liberated by enzymes too slowly from heated casein to allow effective supplementation of the other amino acids absorbed earlier. Differences in rate of liberation of amino acids from overheated casein occur not during pepsin digestion, but rather during subsequent treatment with pancreatin and erepsin (118).

Autoclaving damages the nutritive value of casein more when dextrose is mixed with the protein than when it is absent (119). After heating with dextrose, casein is resistant to the action of trypsin and papain, but not to that of pepsin, chymotrypsin, and pancreatin (120). Since free amino groups are important for the activity of trypsin, reaction between the amino groups of casein and dextrose during autoclaving is indicated and offers a possible explanation for the lowered nutritive value of the protein.

Less experimental work has been done on lactalbumin than on casein. Its digestibility is lowered by overheating (121), evidently due to changes in the linkages between the amino acids which render them less susceptible to enzymatic hydrolysis (122). Possibly a reaction of the protein with lactose is responsible for these new linkages, since lactalbumin extracted to remove reducing sugar was not as seriously impaired by autoclaving as commercial lactalbumin, or as extracted lactalbumin that had been reconstituted with lactose to the carbohydrate content of the original protein (123). Thus the effect of naturally occurring lactose on lactalbumin is similar to that of added glucose on casein. Lysine is not damaged in overheated lactalbumin, since additions of lysine or of lysine and histidine do not restore the quality of the protein (122).

Excessive heat treatments have been used for most of the work on casein and lactalbumin. The more moderate heat used in pasteurizing (124), evaporating and canning (125), or cooking (126) had little effect on the digestibility or biologic value of the milk proteins, while commercial sterilization of milk lowered the biologic value of the proteins about 6 per cent (127, 128). Similar lowering (8 per cent) of the biologic value was noticed in the preparation of spray-process skim milk powders; this loss could be avoided by omitting preheating (129). Raising the temperature in the roller process until scorching occurs, rapidly lowers the biologic value of the milk proteins, due to lysine damage (129). During the storage of dried skim milk of high moisture content, the biologic value of its proteins decreases, due to damage of the lysine (130); milk powders of low moisture content are much more stable. Dried skim milk stored until it was discolored and unpalatable suffered marked losses of arginine, histidine, lysine, and methionine (131).

### CEREALS

Morgan and her co-workers (132, 133) found that cooking cereals in water had little effect on the nutritive value of the proteins, but that toasting of bread, or of prepared cereals during manufacture altered the proteins so that they were not well utilizd for rat growth. This appeared to be due to a loss of nitrogen in the urine of animals fed toasted cereals, rather than to differences in digestibility. This work was confirmed by the finding of Murlin and his associates (134, 135) that flaked or puffed cereals had lower biologic values and egg replacement values for humans than the untreated cereals, probably because of the high heat used in the manufacture of the prepared cereals. Further confirmatory evidence on rats fed exploded oat products (136) and flaked, toasted corn (99) has been offered.

Thus, there seems to be no doubt that the heat used during the manufacture of certain prepared cereals impairs the nutritive value of their proteins. However, the chemical nature of the changes involved is not clear at present. Mitchell and Block (137) have shown that even the severe heat of the gun explosion process used in preparing puffed cereals does not alter appreciably the amino acid content.

Lysine damage by dry heat has been demonstrated (138) in a "cake mix" heavily fortified with dried egg white and lactalbumin for the use of surgical patients. Since wheat furnished only a small proportion of the total protein of the cake mix, this does not prove that the lysine of the wheat was damaged by heat. Indeed, Kuether and Myers (139) have shown that lysine improved the nitrogen balances of human beings to the same extent, whether they were fed rolled oats or exploded oat cereal. The improvement of the unprocessed cereal by lysine is explained by the fact that the proteins of wheat, oats, and corn are deficient in this amino acid.[4]

## SUMMARY

Experimental evidence indicates that moderate heating of raw soybeans increases their digestibility and biologic value and makes the meager amount of cystine and methionine which they contain more available in metabolism. It also shows that raw soybeans contain several heat-labile factors which inhibit growth and the proteolytic effect of trypsin. The harmful effects of excessive heating on the nutritive value of soybeans may be due to the formation by certain amino acids of enzyme-resistant linkages, possibly caused by their reaction with the reducing sugars which soybeans contain. While the nutritive value of the protein of certain other legumes is improved by heating, this is not true of most varieties of peas, or of peanuts.

Egg white contains a trypsin inhibitor, the protein ovomucoid, which is inactivated by heating.

Home cooking methods have little effect on the amino acid composition of meat, but may decrease the biologic value of the protein slightly. Excessive heat lowers the nutritive value of meat protein, probably by forming enzyme-resistant linkages.

Overheating casein makes enzymatic release of its lysine difficult. Lactalbumin is also damaged by overheating, especially when lactose is present. However pasteurizing, evaporating, canning, or cooking milk has little effect on the nutritive value of its proteins. Some damage to the proteins may occur in drying milk and in storing dried milk.

The nutritive value of the protein of cereals is not damaged by cooking with water, but is lowered by toasting, as in processing flaked or puffed cereals.

[4] In a paper published while this article was in press, Brockington (Food Technol. 4: 396, 1950) reported that less lysine was obtained with enzymatic hydrolysis than with acid hydrolysis from a ready-to-eat oat cereal. The addition of lysine to exploded oats improved their growth-promoting value, but did not restore completely the value of unheated oats, suggesting that decreased availability of lysine was not the only change produced in the protein by heat. The contrast between these findings and those of Mitchell and Block (137) may be due to the fact that the latter investigators determined lysine by an isolation method, while Brockington used the newer microbiologic procedure.

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# Nutritional Status Survey, Groton Township, New York

## V. Physical Findings[1]

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METHODS of selection of subjects and procedures employed in the study of the nutritional status of a group of people in Groton Township, Tompkins County, New York, have been described in previous papers of this series (1–4). It is the purpose here to present data obtained from physical inspections of participating subjects made concurrently with blood nutrient level studies and within four weeks of the time that the diet inventories were done.

The physical inspection consisted of examination of eyes, lips, gums, teeth, tongue, buccal mucosa, and the skin of the face, neck, and arms; palpation of the thyroid gland; determination of the patellar and Achilles tendon reflexes; examination of the lower extremities for edema and calf tenderness; and measurement of the systolic and diastolic blood pressure. Measurements of height and weight were made by non-medical personnel. The data from the physical inspections were recorded on forms recommended by the U. S. Public Health Service and transferred to special code sheets from which cards were punched. Statistical analysis of physical defects and their correlation with other data were made.

In Table 1 is given the percentage distribution of the abnormal findings in both the fall and spring. A total of 640 subjects were examined in the fall, and 450 of the same subjects were re-examined the following spring. Overweight and underweight are listed as 10 per cent above or below the standard weights from the tables of Davenport (5). In Table 2, a more detailed account of weight is given. Here the percentage deviation of overweight and underweight for both men and women at ages varying from childhood to old age is presented.

It can be seen at once that the number of abnormal physical signs was low with the exception of overweight and dental pathology, both of which were relatively high. There is fairly good agreement between the figures for the fall and spring studies. As might be expected, overweight was the most common nutritional defect found. Table 2 indicates that the more severe this defect becomes, the more usual is it to find it occurring in women. Our data reinforces the growing opinion that the most important nutritional problem in adults in this country is obesity.

### RELATION OF PHYSICAL SIGNS OF DIETARY INTAKE AND BLOOD CHEMICAL FINDINGS

The paucity of physical findings made it statistically untenable to make correlation studies between physical signs and intakes or blood levels. However, nutrient intake and blood level data were reviewed on those individuals showing abnormal physical signs, and it was discovered that there was wide variation in both nutrient intakes and blood levels.

For example, in the subjects with folliculosis, their vitamin A intakes and vitamin A and carotene blood levels were listed, and these data were compared with the distribution data on vitamin A intakes and vitamin A and carotene blood levels of the entire group. In the same manner intakes and blood levels of subjects who had conjunctival inflammation or thickening were compared. Cheilosis, bulbar vascularization, bulbar conjunctival thickening, nasolabial seborrhea, and suborbital pigmentation were studied in relation to riboflavin intake. Stomatitis, red tongue, and atrophied tongue papillae were studied in relation to niacin intake, and ascorbic acid blood levels and food intake were studied where gingivitis was found.

The results of such studies are typified by the following data on vitamin A nutriture in subjects with palpebral conjunctivitis. There were 36 such subjects. Of these, 8 had an estimated vitamin A intake below 70 per cent of Recommended Dietary Allowances. Six received from 70 per cent to 130 per cent of these allowances, and 22 had over 130 per cent. The vitamin A blood levels of the 36 subjects were distributed as follows: 2 had less than 30 mcg. per 100 cc., 21 had from 30 to 60 mcg., and 12 had more than 60 mcg.

[1] Received for publication August 9, 1950.

TABLE 1

*Percentage distribution of physical findings*

| PHYSICAL SIGN OR SYMPTOM | PERCENTAGE OF SUBJECTS | |
|---|---|---|
| | Fall | Spring |
| Overweight | 28.0 | |
| Underweight | 16.9 | |
| Blepharitis | | |
| Mild | 3.6 | 0.5 |
| Moderate | 0.8 | 0.5 |
| Severe | 0.0 | 0.0 |
| Inflammation of palpebral conjunctiva | | |
| Mild | 4.8 | 5.3 |
| Moderate | 0.9 | 0.6 |
| Severe | 0.0 | 0.0 |
| Increased vascularity of palpebral conjunctiva | | |
| Mild | 6.4 | 4.0 |
| Moderate | 1.5 | 0.8 |
| Severe | 0.3 | 0.0 |
| Thickening of bulbar conjunctiva | | |
| Mild | 0.3 | 0.2 |
| Moderate | 0.1 | 0.0 |
| Severe | 4.5 | 2.7 |
| Lesions of outer canthus | 0.1 | 0.0 |
| Changes in tongue papillae | | |
| Atrophy | 3.3 | 1.5 |
| Hypertrophy | 2.7 | 0.0 |
| Cheilosis | | |
| Mild | 1.5 | 1.1 |
| Moderate | 0.0 | 0.3 |
| Severe | 0.0 | 0.0 |
| Angular cracks | 1.1 | 2.0 |
| Stomatitis | | |
| Mild | 1.5 | 0.0 |
| Moderate | 0.7 | 0.5 |
| Severe | 0.0 | 0.0 |
| Gingivitis | | |
| Mild | 6.9 | 2.9 |
| Moderate | 2.5 | 1.0 |
| Severe | 0.0 | 0.0 |
| Abnormal color of tongue | | |
| Red | 4.8 | 0.8 |
| Magenta | 0.3 | 0.0 |
| Fissuring of tongue | | |
| Mild | 3.3 | 1.8 |
| Moderate | 1.5 | 0.5 |
| Severe | 0.1 | 0.0 |
| Dentures | | |
| Complete upper | 6.5 | 5.3 |
| Complete lower | 5.3 | 3.8 |
| Both | 12.0 | 15.0 |
| Carious teeth, unfilled (number) | | |
| 0 | 71.7 | 77.0 |
| 1-2 | 8.3 | 7.3 |
| 3-5 | 8.0 | 9.3 |
| 6+ | 11.9 | 6.1 |
| Teeth absent (number) | | |
| 0 | 55.2 | 60.0 |
| 1-2 | 13.6 | 11.1 |
| 3-5 | 17.0 | 12.2 |
| 6+ | 14.1 | 16.4 |
| Teeth filled (number) | | |
| 0 | 43.1 | 44.0 |
| 1-2 | 6.3 | 3.8 |
| 3-5 | 12.3 | 13.1 |
| 6+ | 38.4 | 39.0 |
| Enlarged thyroid | | |
| Mild | 3.7 | 1.5 |
| Moderate | 0.5 | 0.5 |
| Severe | 0.5 | 0.2 |
| Suborbital pigmentation | 1.4 | 0.2 |
| Nasolabial seborrhea | | |
| Mild | 3.3 | 0.2 |
| Moderate | 1.2 | 0.2 |
| Severe | 0.0 | 0.0 |
| Acne | | |
| Mild | 4.2 | 1.0 |
| Moderate | 0.8 | 0.2 |
| Severe | 0.0 | 0.2 |
| Hyperkeratosis | | |
| Mild | 1.5 | 0.9 |
| Moderate | 0.8 | 0.0 |
| Severe | 0.0 | 0.0 |
| Dryness of skin | | |
| Mild | 5.3 | 2.9 |
| Moderate | 1.2 | 0.0 |
| Severe | 0.0 | 0.0 |
| Folliculosis | 0.5 | 0.7 |
| Absent deep tendon reflexes | 0.0 | 3.2 |

Similar variations occurred in the other physical findings studied. For each specific physical sign, there were individuals with low intakes of the particular nutrient involved, and these individuals might actually represent a deficiency of that nutrient. On the other hand, equal or larger numbers with the same physical signs had apparenty adequate intakes and/or blood levels. Furthermore, large numbers with low intakes and/or blood levels did not show the commonly-accepted signs of such deficiencies.

## DISCUSSION

Some of the discrepancies cited above can probably be explained by the fact that while the family food data of this survey covered a full week, the individual data available for comparison were for one day only, and this may not have been representative of the customary intakes. This problem is discussed in a previous paper (2). A second relevant factor is the lack of agreement among the physicians as to the presence or absence of certain deficiency signs. This is illustrated by the following two findings in the present survey: Of the 31 subjects in the spring survey who were recorded as having red tongue, 21 were reported by 1 physician, while the remaining 10 were scattered among the other 4 physicians. Also, of 10 reported cases of cheilosis, 8 were found by 1 physician. These are the two most extreme examples found, but they serve to illustrate the point.

If the aim of a survey of this kind is to determine how many persons are deficient in specific nutrients, then how are such findings as the ones illustrated here to be interpreted? What are the other factors that render so difficult the collection and interpretation of data in the nutrition survey? It is in this area that considerable attention is now being given by workers with long experience in the clinical aspects of nutrition. Over the years workers in physiology have taught us ideas of normal values. Long before the vitamins were discovered, observations had revealed that in biology one cannot arbitrarily set up standards of normalcy and consider all who do

TABLE 2

*Number of persons in each percentage group of overweight and underweight, according to age and sex*

| AGE | SEX | NUMBER OF PERSONS ACCORDING TO DEVIATION FROM RECOMMENDED STANDARD | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 10–19% | 20–29% | 30–39% | 40–49% | 50–59% | 60–69% | 70–79% | 80–89% | Total |
| **Overweight** | | | | | | | | | | |
| *years* | | | | | | | | | | |
| Below 10 | Male | 12 | 1 | | | | | | | 13 |
| | Female | 3 | 1 | 1 | | | | | | 5 |
| 10–19 | Male | 11 | 3 | 2 | | | | | | 16 |
| | Female | 8 | 3 | | 1 | 1 | | | | 13 |
| 20–39 | Male | 14 | 12 | 3 | 1 | | | | | 30 |
| | Female | 14 | 6 | 1 | 4 | | | | | 25 |
| 40–59 | Male | 11 | 8 | 2 | 2 | | | | | 23 |
| | Female | 11 | 9 | 4 | 1 | 2 | | | 2 | 29 |
| 60–79 | Male | 7 | 2 | | | | 1 | | | 10 |
| | Female | 9 | 4 | 4 | | 1 | | | | 18 |
| Total | Male | 55 | 26 | 7 | 3 | | 1 | | | 92 |
| | Female | 45 | 23 | 10 | 6 | 4 | | | 2 | 90 |
| **Underweight** | | | | | | | | | | |
| Below 10 | Male | 3 | | | | | | | | 3 |
| | Female | 3 | | | | | | | | 3 |
| 10–19 | Male | 7 | 1 | | | | | | | 8 |
| | Female | 5 | | 1 | | | | | | 6 |
| 20–39 | Male | 15 | | | | | | | | 15 |
| | Female | 33 | 8 | | | | | | | 41 |
| 40–59 | Male | 10 | 2 | | | | | | | 12 |
| | Female | 9 | 2 | | | | | | | 11 |
| 60–79 | Male | 8 | | | | | | | | 8 |
| | Female | 1 | 2 | | | | | | | 3 |
| Total | Male | 43 | 3 | | | | | | | 46 |
| | Female | 51 | 12 | 1 | | | | | | 64 |

not meet them as abnormal. Clinical medicine has delineated the fact that the genus *Homo* must be judged according to a *range* of normal values, that a sharp distinction between normal and abnormal does not exist for either an individual or a group. The clinician uses non-arbitrary standards in his thinking. He recognizes that degrees of normal and abnormal exist. He adds up the evidence revealed in the patient's history, objective signs which can be elicited from his examination and the results of laboratory tests, and comes to a conclusion regarding the likelihood for a diagnosis.

The use of arbitrary standards as advocated by early workers in nutrition was in direct conflict with the concepts of clinical medicine. The tenet that changes resulting from deficiencies are tissue specific and therefore easily diagnostic has been challenged. Too many popular reports along this line have caused exaggerated or inaccurate statements. Moore and Maynard in 1945, commenting on the need for a broader understanding of nutrition principles, said (6): "There have been attempts in recent years to appraise the nutritional status of individuals by laboratory and special instrument methods. Physicians followed this program with the highest of hopes. Then, one after another, the exalted experiments or easy signs of nutritional deficiencies fell short."

If there cannot be general agreement among experienced observers as to what moderate to mild changes mean, then what chance is there for uniform thinking, charting, and interpretation among physicians who, after examination of patients, may discount the changes as normal or ascribe them to a causative agent unrelated to nutrition? We have presented evidence that such thinking was operating among the medical team assisting with this survey. Even though briefed in recording all abnormal findings, it seems certain that the training and experience of the individual physician resulted in non-uniformity of interpretation of mild deviations in "pathology."

We have seen in the preceding papers of this series that the means of assessing nutriture in a survey are: (a) clinical examination with demonstration of a specific lesion, (b) demonstration of biochemical alteration, and (c) estimation of dietary intake. There may be many associated problems with the latter; educational, socio-economic, food processing, and distribution—all pertinent and each discussed adequately by other contributors to this series.

Five years ago Dann and Darby stated (7) that mild deficiency disease was frequently diagnosed from the presence of conjunctival changes, angular stomatitis, changes in color of tongue, and so on, and that in their opinion, such signs were not pathognomonic of specific deficiencies. They concluded that "the prevalence of mild manifest deficiency diseases is a matter of great doubt, since the diagnostic criteria are not generally agreed upon." More recently Darby has emphasized the non-specificity of most of the signs which have been considered to indicate specific vitamin deficiencies (8).

With limitation of methods, one begins to realize how difficult it would be to demonstrate the prevalence of sub-nutrition as defined by Dann and Darby (7). It is questionable, with the exception of obesity (excess calories), if their zone of *saturation* is of importance. People in the *unsaturated but functionally unimpaired* zone cannot be detected by clinical methods, but probably they are in the zone in which the majority of people fall. We believe that the Dann and Darby zone of *potential deficiency disease* may one

day be of clinical importance when either a biochemical change or a physiologic lesion can be produced on test. It is perhaps in this zone where much thinking has been stimulated in the minds of surgeons who now respect the sub-nutritional state of patients as regards surgical post-operative prognosis and endeavor to uncover bad risks by means of excretion tests or even response to ACTH.

It is the zone of *latent deficiency disease* where controversy over physical signs begins. Dann and Darby called this the zone of diagnostic therapy, i.e., nonspecific symptoms given clinical therapeutic trial. But as Ruffin points out (9): "Vague symptoms such as weakness, fatigability, insomnia, nervousness, and irritability are more apt to be due to overwork, nervous tension, or to social, domestic or financial difficulty than to a vitamin deficiency—that for the most part, prolonged vitamin therapy in the absence of obvious disease is useless".

In the final zone of Dann and Darby, that of *manifest deficiency disease*, are concentrated the data of this paper. From the previous discussion, one may ascertain that we believe it is doubtful if deficiency disease resulting in anatomic changes occurs in many individuals in a community like Groton, and if subnutritional states do exist, they cannot be detected by clinical interpretation of mild or moderate anatomic lesions. Physicians are conditioned to major pathologic deviations as seen in pellagra and beriberi, but are subject to the confusion most physicians confess to have when they catalog signs which to them may or may not have an abnormal meaning.

## SUMMARY AND CONCLUSIONS

Physical defects, commonly ascribed to poor nutritional intake and discovered in the course of physical inspections of 690 individuals in a small rural community, are presented. Correlation studies between physical findings, dietary intake, and blood levels of nutrients (hemoglobin, vitamin A, carotene, and ascorbic acid) revealed little correlation. Physical inspections and blood level determinations were repeated six months later on 450 of the same subjects. There was no appreciable change in either of the findings.

The principal conclusions drawn from these data are: (a) This is a study of a well-nourished population. (b) There were few significant physical findings. (c) Most of the signs noted were not actually the result of nutritional deficiencies. The one exception is the large number of people who were overweight; 28.0 per cent of the people studied were overweight according to accepted standards; 16.9 per cent were underweight.

Comment is made regarding the changing concepts of the value of charting detailed minor deviations in anatomic structure. It is inferred that if this type of inspection continues to be part of nutritional surveys, the medical teams must have special training before they will agree on the meaning of "pathologic" changes.

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## Handling Sharp Kitchen Tools

Food preparation or baking includes such operations as washing, peeling, chopping, and dicing. If care is not taken in the handling of sharp tools, these operations may result in accidents. Remember the following rules in handling sharp knives:

(a) Keep knives sharp—dull ones are more dangerous.
(b) Use the right knife for the job.
(c) Cut away from the body.
(d) Don't "palm" vegetables or fruit and then attempt to cut.
(e) Keep knives in knife holder or in racks when they are not being used.
(f) Don't use knives to open cans, jars, or other containers.
(g) Never leave a sharp-edged tool lying loose. It is likely to be covered over and then cause a cut later when whatever covers it is picked up.

*—From News Letter on Food Distribution Branch Activities, October 13, 1950, by Oscar F. Beyer, Production and Marketing Administration, U. S. Department of Agriculture, Chicago.*

# Sodium Values of a Selected Group of Foods

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REVIVAL of the use of low-sodium diets in treating diseases in which edema and hypertension occur has led to a more careful scrutiny of the published tables on sodium content of foods and to the development of new methods for sodium analysis. An examination of four food tables, three reporting values based on the old conventional methods of chemical analysis (1–3) and one giving data obtained by the newer flame photometry (4) revealed wide variations for a given food. The values based on the older methods were found usually to be higher than those obtained by flame photometry. This might be explained in part by the incomplete separation of potassium and the weighing of traces of potassium as sodium in certain of the chemical methods used. Also factors unrelated to analytical procedures such as varietal differences and variation in soil and climatic conditions may account for the wide range of sodium values reported for foods of plant origin, where the widest ranges of values were observed.

In planning low-sodium diets the dietitian is confronted with the problem of selecting values to use in calculating sodium content. A consideration of this problem led the authors to believe that it would be desirable to obtain more data on the sodium content of foods using the modern flame photometry for analysis. Data thus obtained are at present rather limited.

## EXPERIMENTAL PROCEDURE

Foods for which variations in the sodium content as reported in the different tables were greatest were selected for analysis. We were also interested in obtaining more data on certain foods, namely bananas and frozen vegetables, which have been considered by some too high in sodium content to be used in low-sodium diets. Some foods for which no data were found, including beef broth, enriched farina, and green onions, were analyzed. The broth was made by cooking 1 lb. beef in distilled water 4 hr., then straining and diluting it with distilled water to make duplicates of 100 ml. each. This could be analyzed without ashing, for there was no matter present to clog the flame photometer. The procedure of Bills (5) was used for the preparation of the other foods for analysis. The Beckman flame spectrophotometer was employed for the analyses. Duplicate analyses were made for each sample.

## RESULTS

The results of the analyses are recorded in Table 1. Also included is the moisture content of the foods since it was felt that this might add to the value of the data. Wide variations in different samples of the same food were frequently encountered. There were a number of instances, however, in which sodium values obtained on the two samples were in agreement (head lettuce, macaroni, and canned plums) or varied only slightly (broccoli, cabbage, celery, dried apricots, grapes, canned peaches, frozen peas, peeled potatoes, radishes, raspberries, oatmeal, rice, and navy beans). The eleven samples of banana, representing bananas from different stalks, varied from 4 to 17.6 mg. sodium per 100 gm. with an average of 12.5 mg. Some of the other fresh fruits were as high or higher in sodium content. Sodium values were obtained for four frozen products (asparagus, broccoli, corn, and peas). With the exception of asparagus, the values were in the higher ranges found for the fresh vegetables, frozen corn being the highest.

In Table 2 is presented a comparison of the sodium values of foods analyzed in this laboratory with values previously published. Three sets of values—McCance and Widdowson (1), Peterson, Skinner, and Strong (2), and Sherman (3)—are based on the older methods of analysis. The data reported by Bills *et al.* were obtained by the flame photometer method (5, 6) which furnished the background for our work.

It should be kept in mind in comparing values that the older tables represent averages in many

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[2] The authors wish to express their appreciation to Dr. E. D. Schall of the Department of Agricultural Chemistry for technical assistance. The sodium readings in the flame spectrophotometer were made by Dr. Schall and assistants.

TABLE 1

*Sodium content of foods analyzed*

| FOOD | FRESH WEIGHT OF SAMPLE | MOISTURE | SODIUM |
|---|---|---|---|
| | *gm.* | % | *mg./100 gm.* |
| Apple, peeled | | | |
| Sample 1 | 50 | 84.4 | 5.5 |
| Sample 2 | 50 | 85.0 | 11.2 |
| Apricots, canned, drained | | | |
| Sample 1 | 50 | 78.4 | 7.5 |
| Sample 2 | 50 | 78.6 | 13.4 |
| Apricots, dried | | | |
| Sample 1 | 50 | 24.0 | 35.4 |
| Sample 2 | 50 | 25.0 | 31.0 |
| Asparagus, frozen | | | |
| Sample 1 | 50 | 91.8 | 8.8 |
| Sample 2 | | 92.4 | 17.2 |
| Banana | | | |
| Sample 1 | 50 | 74.2 | 14.0 |
| Sample 2 | 50 | 74.2 | 10.0 |
| Sample 3 | 50 | 71.0 | 15.4 |
| Sample 4 | 50 | 72.2 | 14.4 |
| Sample 5 | 50 | 73.8 | 10.4 |
| Sample 6 | 50 | 74.2 | 14.8 |
| Sample 7 | 50 | 65.0 | 7.6 |
| Sample 8 | 50 | 77.4 | 17.6 |
| Sample 9 | 50 | 74.0 | 12.2 |
| Sample 10 | 50 | 74.0 | 4.0 |
| Sample 11 | 50 | 75.0 | 17.4 |
| Beans, green | | | |
| Sample 1 | 50 | 91.6 | 3.0 |
| Sample 2 | 50 | 91.2 | 1.0 |
| Beans, navy | | | |
| Sample 1 | 50 | 10.0 | 42.0 |
| Sample 2 | 50 | 10.0 | 38.0 |
| Broccoli buds | | | |
| Sample 1 | 25 | 88.4 | 16.8 |
| Sample 2 | 25 | 86.4 | 20.0 |
| Broccoli stems | | | |
| Sample 1 | 25 | 92.8 | 38.4 |
| Sample 2 | 25 | 92.4 | 36.8 |
| Broth, beef (unsalted) | | | |
| Sample 1 | * | — | 56.2 |
| Sample 2 | * | — | 56.2 |
| Brussels sprouts, frozen | | | |
| Sample 1 | 25 | 95.2 | 20.8 |
| Sample 2 | 25 | 94.8 | 32.4 |
| Cabbage | | | |
| Sample 1 | 50 | 91.6 | 18.0 |
| Sample 2 | 50 | 91.8 | 21.0 |
| Celery, Pascal | | | |
| Sample 1 | 15 | 95.3 | 130.65 |
| Sample 2 | 15 | 95.3 | 132.33 |
| Cherries, red, canned | | | |
| Sample 1 | 50 | 88.2 | 11.6 |
| Sample 2 | 50 | 88.4 | 9.6 |
| Corn, frozen | | | |
| Sample 1 | 50 | 94.6 | 112.5 |
| Sample 2 | 50 | 93.8 | 91.5 |
| Cornmeal, white refined | | | |
| Sample 1 | 50 | 9.4 | 26.0 |
| Sample 2 | 50 | 9.2 | 16.0 |
| Cream of Wheat, enriched | | | |
| Sample 1 | 50 | 7.2 | 228.0 |
| Sample 2 | 50 | 7.8 | 282.0 |
| Cucumber, peeled | | | |
| Sample 1 | 50 | 96.4 | 6.0 |
| Sample 2 | 50 | 95.4 | 11.0 |
| Grapefruit, sections | | | |
| Sample 1 | 50 | 88.6 | 3.5 |
| Sample 2 | 50 | 89.2 | 1.0 |
| Sample 3 | 50 | 90.6 | 1.7 |
| Sample 4 | 50 | 91.0 | 3.2 |
| Sample 5 | 50 | 88.4 | 4.9 |
| Sample 6 | 50 | 90.8 | 7.0 |
| Sample 7 | 50 | 84.8 | 3.8 |
| Grapes, Tokay | | | |
| Sample 1 | 50 | 77.0 | 30.4 |
| Sample 2 | 50 | 75.8 | 28.0 |
| Lettuce, head | | | |
| Sample 1 | 25 | 93.6 | 36.0 |
| Sample 2 | 25 | 92.8 | 36.0 |
| Macaroni, dry | | | |
| Sample 1 | 50 | 8.0 | 13.4 |
| Sample 2 | 50 | 8.0 | 13.4 |
| Oatmeal, dry | | | |
| Sample 1 | 50 | 8.1 | 33.0 |
| Sample 2 | 50 | 8.4 | 32.0 |
| Onions, peeled | | | |
| Sample 1 | 50 | 93.8 | 6.5 |
| Sample 2 | 50 | 92.8 | 15.5 |
| Sample 3 | 50 | 91.0 | 10.6 |
| Sample 4 | 50 | 92.4 | 11.6 |
| Onions, green (white and green portion†) | 50 | 93.6 | 17.6 |
| Oranges, sectioned | | | |
| Sample 1 | 50 | 86.8 | 14.0 |
| Sample 2 | 50 | 86.2 | 17.0 |
| Peaches, canned, drained | | | |
| Sample 1 | 50 | 80.8 | 12.4 |
| Sample 2 | 50 | 81.2 | 13.6 |
| Pears, canned, drained | | | |
| Sample 1 | 50 | 79.6 | 14.2 |
| Sample 2 | 50 | 78.6 | 2.8 |
| Pears, fresh, peeled | | | |
| Sample 1 | 50 | 86.6 | 18.0 |
| Sample 2 | 50 | 86.4 | 13.6 |
| Peas, frozen | | | |
| Sample 1 | 50 | 78.8 | 24.5 |
| Sample 2 | 50 | 79.4 | 21.5 |
| Pineapple, canned, drained | | | |
| Sample 1 | 50 | 78.6 | 4.6 |
| Sample 2 | 50 | 80.2 | 6.8 |
| Pineapple, fresh, peeled | | | |
| Sample 1 | 50 | 84.4 | 4.4 |
| Sample 2 | 50 | 84.6 | 7.4 |
| Plums, canned, drained | | | |
| Sample 1 | 50 | 76.6 | 9.5 |
| Sample 2 | 50 | 74.6 | 9.0 |
| Potato, Irish, peeled | | | |
| Sample 1 | 50 | 76.2 | 25.5 |
| Sample 2 | 50 | 78.2 | 23.0 |
| Potato, Irish, unpeeled | | | |
| Sample 1 | 50 | 76.2 | 21.5 |
| Sample 2 | 50 | 86.2 | 12.0 |
| Sample 3 | 50 | 79.8 | 8.8 |
| Prunes, dried | | | |
| Sample 1 | 50 | 26.8 | 28.0 |
| Sample 2 | 50 | 16.8 | 15.0 |
| Radishes | | | |
| Sample 1 | 50 | 96.0 | 28.4 |
| Sample 2 | 50 | 95.8 | 28.4 |
| Raisins, dried | | | |
| Sample 1 | 15 | 16.0 | 67.0 |
| Sample 2 | 15 | 18.0 | 62.3 |
| Raspberries, canned | | | |
| Sample 1 | 50 | 70.0 | 8.5 |
| Sample 2 | 50 | 70.1 | 8.3 |
| Rice, dry | | | |
| Sample 1 | 50 | 10.2 | 11.4 |
| Sample 2 | 50 | 10.0 | 11.8 |
| Sweet potato, peeled | | | |
| Sample 1 | 50 | 63.0 | 43.5 |
| Sample 2 | 50 | 71.4 | 50.0 |
| Tomato, unpeeled | | | |
| Sample 1 | 50 | 93.2 | 23.0 |
| Sample 2 | 50 | 94.8 | 17.5 |

* Made from ½ lb. raw beef.

† Only one sample analyzed.

TABLE 2

*Comparison of sodium values found in this investigation with those of other investigators*

| FOOD | SODIUM CONTENT | | | | | |
|---|---|---|---|---|---|---|
| | This study | | Bills *et al.* (5, 6) | McCance and Widdowson (1) | Peterson, Skinner, and Strong (2) | Sherman (3) |
| | Number of samples | Range | | | | |
| | | *mg./100 gm.* | *mg./100 gm.* | *mg./100 gm.* | *mg./100 gm.* | *mg./100 gm.* |
| Apples | 2 | 5.5– 11.2 | 0.1 | 2.7 | 15.0 | 10.0 |
| Apricots, canned | 2 | 7.5– 13.4 | 2.0 | 0.9 | — | — |
| Apricots, dried | 2 | 31.0– 35.4 | — | 56.4 | 109.0 | — |
| Asparagus, frozen | 2 | 8.8– 17.2 | 3.0 | — | — | 7.0 |
| Banana | 11 | 4.0– 17.2 (average—12.5) | 0.1 | 1.2 | 23.0 | 42.0 |
| Beans | | | | | | |
| Green | 2 | 1.0– 3.0 | 0.8 | 6.5 | 12.0 | 23.0 |
| Navy | 2 | 38.0– 42.0 | 0.9 | 43.2 | 189.0 | 103.0 |
| Broccoli | | | | | | |
| Buds | 2 | 16.8– 20.0 | — | 6.8 | — | 24.0 |
| Stems | 2 | 36.8– 38.4 | 16.0 | — | 30.0 | 62.0 |
| Broth, beef, (unsalted) | 2 | 56.2* | — | — | — | — |
| Brussels sprouts, frozen | 2 | 20.8– 32.4 | 9.0 | — | — | — |
| Cabbage | 2 | 18.0– 21.0 | 5.0 | 31.6 | 38.0 | 32.0 |
| Celery | 2 | 130.6–132.3 | 110.0 | 137.0 | 28.0 | 130.0 |
| Cherries, red, canned | 2 | 9.6– 11.6 | 0.7 | 1.5 | — | — |
| Corn, frozen | 2 | 91.5–112.5 | 9.0 | — | — | — |
| Cornmeal | 2 | 16.0– 26.0 | — | 51.6 | — | 39.0 |
| Cream of Wheat | 2 | 228.0–282.0 | — | 605.0† | 106.0‡ | 65.0§ |
| Cucumbers | 2 | 6.0– 11.0 | 0.8 | 13.0 | 26.0 | 10.0 |
| Grapefruit | 7 | 1.0– 7.0 (average—3.6) | 0.4 | 1.4 | 6.0 | 4.0 |
| Grapes | 2 | 28.0– 30.4 | 4.0 | 1.5 | 11.0 | 11.0 |
| Lettuce, head | 2 | 36.0* | 12.0 | 3.1 | 28.0 | 30.0 |
| Macaroni | 2 | 13.4* | 1.0 | 25.6 | 10.0 | 18.0 |
| Oatmeal | 2 | 32.0– 33.0 | 2.0 | 33.4 | 72.0 | 71.0 |
| Onions | | | | | | |
| Green (white and green portion) | 1 | 17.6 | — | — | — | — |
| Peeled | 4 | 6.5– 15.5 | 1.0 | 10.2 | 20.0 | 15.0 |
| Oranges | 2 | 14.0– 17.0 | 0.2 | 2.7 | 14.0 | 10.0 |
| Peaches, canned | 2 | 12.4– 13.6 | 6.0 | 1.4 | — | — |
| Pears | | | | | | |
| Canned | 2 | 2.8– 14.2 | 8.0 | 1.4 | — | — |
| Fresh | 2 | 13.6– 18.0 | 2.0 | — | 10.0 | 8.0 |
| Peas, frozen | 2 | 12.5– 24.5 | 100.0 | — | — | — |
| Pineapple | | | | | | |
| Canned | 2 | 4.6– 6.8 | 1.0 | 0.5 | — | — |
| Fresh | 2 | 4.4– 7.4 | 0.3 | 1.6 | 8.0 | 14.0 |
| Plums, canned | 2 | 9.0– 9.5 | 18.0 | 1.6 | — | — |
| Potato, Irish | | | | | | |
| Peeled | 2 | 23.0– 25.5 | 0.6 | 6.5 | 30.0 | 24.0 |
| Unpeeled | 3 | 8.8– 21.5 | — | — | — | — |
| Prunes, dried | 2 | 15.0– 28.0 | 5.0 | 12.0 | 101.0 | 78.0 |
| Radishes | 2 | 28.4* | 8.0 | 59.0 | 83.0 | 64.0 |
| Raisins, dried | 2 | 62.3– 67.1 | 22.0 | 52.2 | 120.0 | 87.0 |
| Raspberries, canned | 2 | 8.3– 8.5 | 0.2 | 1.7 | — | — |
| Rice | 2 | 11.4– 11.8 | 2.0 | 6.3 | 12.0 | 28.0 |
| Sweet potatoes | 2 | 43.5– 50.0 | 4.0 | 17.8 | 31.0 | 27.0 |
| Tomato, fresh | 2 | 17.5– 23.0 | 3.0 | 2.8 | 13.0 | 20.0 |

* Both samples.
† Value for Vita-Wheat.
‡ Value for entire white.
§ Value for farina.

instances of large numbers of samples, while values of Bills and co-workers are for single samples only or, at most, a few samples (4). Likewise, it will be noted in Table 1 that with the exception of a few foods, (bananas, grapefruit, onions, and unpeeled potatoes), our analyses have not covered more than two samples. In light of the differences in samples frequently encountered, the authors realize the shortcomings inherent in such limited data and recognize the importance of increasing the number of analyses in order to arrive at average figures which will be typical of a given food. It is hoped to accomplish this in the near future.

The values obtained in our laboratory were usually considerably higher than those of Bills *et al.* and of McCance and Widdowson, but tended to be lower than those compiled by Peterson, Skinner, and Strong, and by Sherman. In this connection, attention might be called to the statement of Peterson, Skinner, and Strong concerning the occurrence of mineral elements in foods. They state (2) that the composition of any given sample will not necessarily correspond to the figures which they have compiled, but that variations of 100 per cent or more may be encountered. One might assume this to be true even when like methods of analysis are used because of the factors previously mentioned which may affect the sodium content of a plant product. Peterson, Skinner, and Strong consider, however, that such variations are not serious from a dietary standpoint since variations in different foods will cancel one another.

In conclusion, the authors would recommend that the data on the sodium content of food obtained by flame photometry be extended by further analytical work.

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# Workshop Techniques in Action

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THE workshop reported here served a dual purpose (a) to help gain a broader understanding of personnel problems and (b) to teach the actual techniques and operation of a workshop using the "group dynamics" approach. To this end, the writer served both as a resource person giving facts on the subject matter and an instructor and leader in the technique. This paper will be concerned only with his role in teaching workshop technique. The subject matter which is brought in will be only incidental. Certain condensed verbatim excerpts of his explanations taken from the proceedings follow.

**Last year, the Kansas Dietetic Association, in conjunction with the University of Kansas Medical Center Nutrition Service, sponsored a workshop for dietitians at the Medical Center. The topic for the workshop was "problems of personnel management." This article is a brief report of the first phase of the workshop. In it, the author will attempt to explain: first, the structure of a workshop; second, the techniques used; and third, the operation and analysis of these techniques. The quoted material is taken directly from the record made by a court stenographer.**

### PURPOSE OF A WORKSHOP

"First of all, a workshop essentially involves active participation by everybody at the meeting. It is built around discussion—not around the lecture in which the audience participates only passively. A workshop operates on the assumption that all have experiences that are worth sharing, that all can learn from each other, that all can contribute to each other's learning.

"Its main function is to clarify viewpoints, to present new ideas, and to stimulate further thinking and discussion. Its main intent is not necessarily to see that the groups agree on a single point of view or a single plan of action. Your role, then, is to participate and use the facts that the invited speakers will supply. The role of these speakers will be to stimulate you and also to act as resource people to supply facts that may not be at your disposal which are important and pertinent to the discussions.

"These facts themselves are not what you will discuss, although they will form a basis for your discussion. What you will discuss is how you yourselves can utilize these facts, how you can make them meaningful, and how they can be applied in your local situation.

"The techniques we will use are what we call 'group discussion techniques.' Basically, a situation is provided where all of you will have an opportunity to exchange ideas and to work this information out in terms of your own needs and interests."

### SUB-GROUPS

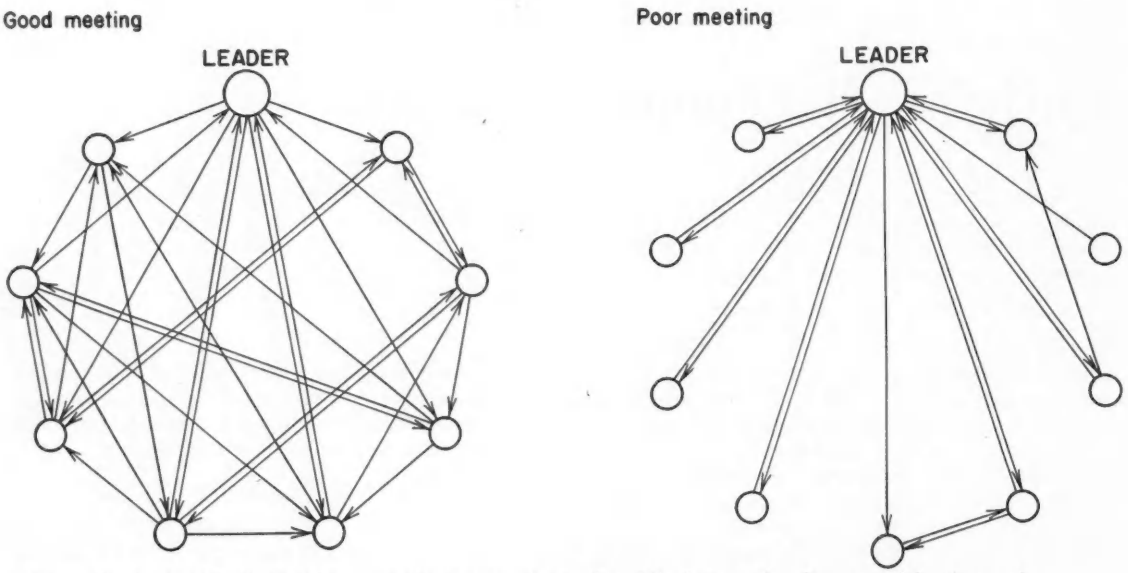
"We can't discuss very efficiently in a large group. Many of you wouldn't participate in such a group, for you would feel inhibited or that there are others who know more than you do. For this reason, we are going to break up into small groups. In these small small groups we want as much heterogeneity as possible. If there are two people here from one institution, we ask that they do not join the same group, for you can't gain from others when you are only going to reinforce what you already know.

"I, as the temporary leader, will give you a topic for discussion, and I am going to ask—I am going to be authoritarian on this despite all I shall say to the contrary—that you try in each group to reach one answer. I realize there are many answers to the problem I will present to you; but for the sake of a goal, I would like only one answer from each group. The discussion in sub-groups will last about 20 min. Then we will spend about 30 min. as a total group discussing the answers the different groups have proposed, and we will try to narrow it down to one answer.

"The small groups should 'unfreeze' you to the point where you will be free to talk in the large group, and you will be surprised, I think, to see how involved you will become."

### THE LEADER

"There are certain definite roles that must be played in a group to make the experience as profitable or as successful as possible. The first job is that of the leader. I think you will find at the end of this




Interaction in a group, the left diagram indicating how leadership shifts in a good audience-participation session.

workshop that the leader who uses these techniques is a different type of leader than any other you have met. He does not tell you what to do; he does not say, 'Now, anybody who wants to talk, raise your hand and I will recognize you'; he does not say, 'You are out of order.' Leadership here is different. It is a function of the group, and as such, it shifts.

"We are not going to appoint leaders, but if you watch what occurs, as you hit different areas that are more meaningful to one of you than to the rest, you will see that person become the leader for that time only. Thus leadership will be a rotating thing. The leader at any given time will be a person who has more to contribute than anybody else, or feels more strongly about a point, or is the person who always says, 'Well, what can we do with this information?' or 'We've spent enough time on that. What do you think of this angle?' The leader will be the summarizer, the person who will keep the group progressing. She can be anybody in the group, and we hope by the time the workshop is over that each of you will have been a leader."

### THE REPORTER AND THE PROCESS OBSERVER

"The second role in a group is the time honored one of reporter or recorder. Usually the reporter is elected. No one wants to volunteer for it, but it is an important role. But don't make one person the recorder for the entire workshop. Each person should try each of the different jobs. We will ask the recorders to give short summaries of the work of their groups so that the total audience can learn what went on in every other sub-group.

"The third job is what we technically call 'process observer.' This person's role is a little different. It is not concerned with what is said—that is the recorder's work. The process observer is concerned with who said what to whom and what was underlying those words. Was the group harmonious? Was there someone in it who was continually negative, who blocked the group all the time? Was there someone who was an opportunist for promoting her viewpoint and making sure the rest of the group conformed to it? Was there anyone who was a passive participant? Were there two or three who dominated the entire situation? (Usually in a situation like this where all of us are rather verbal people, where we are all in a managerial position, we all have that deadly tendency to dominate.)

"The problem I would like you to discuss, then, in the small-group session is: What is our major problem in personnel work in of our institution?"

Following this introduction by the writer, the group was divided into five groups of nine each which met in different rooms. After about 20 min. of small-group activity, the large group reconvened.

### LARGE-GROUP DISCUSSION

The writer temporarily resumed the role of group leader, explaining that he would soon relinquish this part, but would continue to serve as a process observer. He requested the reports of the recorders of the various groups and helped them to clarify their statements for listing on the blackboard. The problems reported were:

(a) Failure to motivate employees in order to get more intelligent workers.

(b) Creation of a feeling of harmony and satisfaction among the workers.

(c) Building toward better interpersonal relationships among employees.

(d) Lack of trained personnel; training responsibilities; and possible responsibilities of sub-professional personnel.

(e) Limits of freedom for employees.

Summarizing the reports, the writer said: "We have, then, the problem of motivation; the problem of harmony; the problem of supervision, especially when the supervisors are untrained; and how far, after you have been permissive, warm, and friendly and nothing has happened, should you go with a person before you use more drastic measures? The floor is open for discussion."

### ROLE-PLAYING TECHNIQUE

A member of the group brought up a question concerning the promotion of an otherwise well-qualified employee whose morals outside of working hours were somewhat questionable. This problem resulted in many questions and a consideration of whether a change could take place in the individual's behavior. Then, the leader, seeing a chance for the group to move forward into an action situation that would involve more members, stepped into the picture and presented a new technique for the group to try—that of "role-playing." He explained, "This is a technique called for by a situation where we wonder how it might appear if we were called on to solve it. It is a means of playing out the situation to see what would happen and then to analyze what occurred during the acting.

"The problem before us is: What should we do with an individual who seems capable, is respected, does a good job, and yet who has, we feel, moral values which are not up to standard? We recognize that promoting such a person may, in some way, reflect on the institution, and yet we feel there is much of value in this person. Could we role play an interview between someone who would play the part of the employee and someone who would play the part of the employer or dietitian?"

Two persons from the group agreed to take these respective roles, one of them being the person who originally brought up the question. While they "acted," the rest of the group was requested to ask themselves, "How would I feel if I put myself in that employee's position? If someone were talking with me this way, would it cause a reaction that would be positive or negative?" The members of the audience were also asked to put themselves in the place of the interviewing dietitian to see how they would react to the employee.

Thus, to use the role-playing technique, three steps had been necessary: the discussion which led to a point where this technique could be used naturally; clarification and definition of the situation by the leader, giving all a common ground; and third, volunteering and doing the actual enactment.

Following the role-playing, the leader first asked the participants for their own reactions so that they would not be on the defensive when the whole group gave their reactions. After some discussion by the group, it was decided that two other people might try to enact the situation, and the role-playing was repeated with different actresses.

At the end of the second scene, there was much involvement of the group and discussion. The content of the discussion centered around the role of the dietitian, the limits of her responsibilities, the effect of the loss of a job on the employee, the duty of the employer in such a case, and so on.

### THE LEADER RECAPITULATES

Then the writer took over again, acting as a summarizer. He remarked: "I think we realize that we are not going to arrive at a solution that will be acceptable to all. Now I would like to summarize as much as I can and then have the process observer's report on participation.

"It seemed fairly well accepted by people nodding and the amount of involvement that the interviewing scene had reached a point indicating the need of the dietitian for the assistance of a specialist in another field, such as psychiatry or clinical psychology. It was also interesting to see how different people handled the same situation."

In discussing the method of group discussion, the leader pointed out: "I noticed that you felt uncomfortable at times. There was a long, seemingly endless silence, and probably some of you thought, 'What happens here?' or 'Why doesn't he give us an answer?' or 'What do we do now?' This was purposeful. It was part of the technique. The theory behind it is: If you put people under stress where they must think, someone will pop up with something significant for everybody and that is just what happened."

He continued, "If I had lectured, if we had done any of the standard things, we would never have moved from the realm of theory, whereas the involvement in this situation was tremendous. I don't believe that there was anyone who didn't try to figure what would be said next, thinking, 'What would I do now if I were up there?' That can only happen when a group is given the freedom to take the discussion pretty well where they wish.

"We never arrived at a common meeting ground on the specific problems presented. We have, on the other hand, synthesized all of them in terms of stating the general problems: 'How do I learn to get along with people?' 'What can I use to work with people?' 'How do we get supervision that is adequate?' You will probably not have those questions answered when you leave the workshop, but you will have started yourselves off on a pattern of thinking so that you can work toward solutions which you can accept and use.

"Everyone has experienced involvement, and all of you will translate differently in terms of the kind of people you are and the kind of situation you meet. May we now have the process report?"

### PROCESS REPORT

The process observer presented a chart with circles to designate each person in the group and many arrows between the circles, indicating the direction and extent of participation. She explained, "In the beginning all statements were directed at the formal leader, a role he didn't accept. Then we had some back-and-forth conversation. First it was between two people, then a third would counteract that. Everyone did not participate here, but there was good representation. Only a few whispered to one another during the course of the overall discussion—two people here, and two people over there. That was all right, for it showed active participation even though it wasn't directed to other members of the group.

"Then two people dominated, but their contributions were good. There was an overall participation in that people nodded and smiled and would have liked to express something, but they held back. The people in this corner just absorbed it all, but they didn't contribute anything, while the women in that corner and people interspersed all over never spoke, but expressed interest insofar as their facial expressions could be read."

The leader then recapitulated the situation, pointing out that in the beginning when someone would raise a point, he had deliberately avoided the responsibility of answering so that the session would not degenerate into a question-and-answer meeting which would not have involved nearly as many people and would not have reached the point it did in terms of participation and involvement.

Actually, in this particular situation, the leader had acted as a combined leader, summarizer for the large group, and observer. This technique, while effective, was perhaps not as good as others. Since the whole session was being recorded by a court stenographer, however, the leader did not feel that it was necessary to have a recorder from the group. In other situations, this would be desirable.

### RÉSUMÉ OF WORKSHOP PROCEDURES

A résumé of procedures used, in chronological order, might prove helpful to groups wishing to use some of these techniques in workshops:

(a) The first task of the workshop leader is to "structure the situation," that is, to clarify the methods that will be used and the rationale behind them. A fundamental part of this task is to explain the roles of leader, recorder, and process observer.

(b) The leader's next task is the actual physical division of the group into workable sub-groups. These groups should be, preferably, heterogeneous in make-up. They should be given a specific "charge" by the leader, so that they can concentrate their energies on a particular question. Although the sub-groups are given the task of reporting one conclusion to the main group, the real reasons for their existence are to allow all to become ego-involved, to allow all to experience participation, and to provide the larger group with a set of stimuli to which they can react.

(c) After the small groups have reassembled, the leader's next task is to gather the reports of the sub-groups. The use of the blackboard as an "open notebook," a device used in this workshop and proposed by Stensland (1) is rather effective. It allows all to concentrate on the reports and makes them focal points for group consideration. In gathering the reports, the leader may act as a clarifier, so that all will understand each report.

(d) The next step is to set the group free, to place responsibility on them for discussing the reports. This is a difficult step, because most of us have a tendency to keep the reins tightly in our own hands. Long pauses are frequent at this stage. The group will attempt to press the leader for answers, and he must be extremely wary of this pitfall. If he succumbs, there is the danger of narrowed participation among the members of the group. Let the pause get lengthy! If you, as leader, feel tense, imagine how the members of the group feel!

(e) The leader should be constantly on the alert to introduce procedures that will act as focal points for group thinking. In this particular workshop, the role-playing technique served this purpose. In introducing a new procedure (as a leader), always make sure that you explain its purpose and that you gain group acceptance of its use. If, for example, the group does not wish to role play, retreat gracefully, and let them continue on their way. Do not force acceptance of your procedures, just because you think them valuable!

(f) A summary statement should be provided in terms of both content covered and the process of the meeting. The content report should be given by the recorder, or in cases such as this workshop, by the leader for demonstration purposes. It should be a summary of the points covered, the areas of agreement or disagreement, and decisions reached. A content report can be called for at any time during the meeting by any member of the group, but it is the leader's responsibility to be sure that one is presented at the end of the meeting.

(g) The process report can also be requested at any time, but should definitely be presented at the end of the meeting. A participation chart is usually a helpful device for depicting flow and degree of participation, but the observer himself must catch the emotional overtones.

(h) It is usually desirable to have some expression from the members as to their feelings about the meeting. This might be called a "post-meeting re-

action check." It may be a simple expression of verbal satisfaction or dissatisfaction, or it may be an elaborate check-list or rating scale, depending upon the use that will be made of it. In the workshop described here, we had simple verbal expressions, made after the meeting.

There is one principle that all good leaders should follow if workshops are to be successful. A leader needs to have a fundamental conviction that the group can work constructively without dominance from him. He must be convinced that group thinking is always superior, in the long run, to individual thinking. He must practice this and let the group set its own goals, its own speed, through group discussion and group planning. If he is fully committed to this, then he can easily learn the techniques. If he is not, then techniques alone will not make him an effective workshop leader.

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## BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

### Russell Henry Chittenden—February 18, 1856–December 26, 1943

Russell Henry Chittenden was born in New Haven, Connecticut, on February 18, 1856, the only son of Horace Horatio Chittenden and Emily Eliza Doane. Study and hard work seem to have come easily for Chittenden. As a boy he worked after school in the plant where his father was superintendent, and he also earned money by raising strawberries. While attending French's Private School and preparing for college, he earned his tuition by teaching the younger boys Latin, mathematics, and geography; Thomas Burr Osborne was one of his pupils at that time. In 1872, Chittenden entered the Sheffield Scientific School and did two years' chemistry work in one. In his senior year, at the age of eighteen, he was placed in charge of a small group of students to teach them physiological chemistry, and the next year the laboratory and class became a permanent part of the curriculum with Chittenden in charge. He obtained his bachelor's degree at the age of nineteen, having prepared a thesis, "Glycogen and Glycocoll in the Muscular Tissue of *Pecten irradians* [scallops]." This was later published in Liebig's *Annalen de Chemie* and was the means of gaining Kühne's interest, with whom he was to study at Heidelberg and later to collaborate in research studies for seven years.

Chittenden received his doctorate in physiological chemistry from Yale in 1880 and in 1882 was made professor of physiological chemistry. He held that post until his retirement in 1922. L. B. Mendel was his pupil and later his successor.

An indefatigable worker, Chittenden became Director of the Sheffield Scientific School in 1898. He was a charter member and president of both the American Physiological Society and the American Society of Biological Chemists, a charter member of the American Institute of Nutrition, and a member of the National Academy. He was one of the editorial committee of the *Journal of Experimental Medicine* and the *American Journal of Physiology*. Many degrees and honors were conferred on him in recognition of his contributions to science.

His major contributions in the field of nutrition were his studies on protein requirements, proteolytic enzymes, and physiology of the gastrointestinal tract.

Chittenden's joy was his work and in the help he could give his pupils. He was frugal in his habits, and Lusk has described him as "short in stature, and slender in frame, with piercing dark eyes which nothing escapes. A true born New Englander, shrewd and able."

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*—Contributed by E. Neige Todhunter, Ph.D., Head, Department of Foods and Nutrition, University of Alabama, Tuscaloosa.*

# The Clinical Center of the National Institutes of Health

## II. Facilities for Food Preparation and Food Service[1]

JACK MASUR, M.D.,[2] and J. H. WERNER[3]

AS THE principal research arm of the U. S. Public Health Service, the National Institutes of Health conduct laboratory research in nearly all fields of medical science. Its Clinical Center, which will be completed in the latter part of 1952, not only will provide necessary additional laboratories, but also will make clinical facilities available to the National Cancer Institute, the National Heart Institute, the National Institute of Mental Health, the National Institute of Neurological Diseases and Blindness, the National Institute of Arthritis and Metabolic Diseases, the National Microbiological Institute, and the National Institute of Dental Research. As part of the coordinated research program of these Institutes, whose investigations cover a wide range of infectious and chronic diseases, the Clinical Center will provide for the study and treatment of patients from all parts of the country.

The Clinical Center is designed approximately in the shape of a Lorraine Cross. The building is completely air conditioned. The central stem utilizes a modified two-corridor, three-function plan. All patients' rooms are located on the south side, the nursing and dietetic service units in the middle, and all clinical laboratories on the north side. The central stem is flanked by six laboratory wings containing the basic science laboratories (1).

The bed capacity of the Clinical Center is 500 and the number of research laboratory modules (12 by 20 ft.) approximately 1100.

Included among the auxiliary service buildings in the construction program is a Shops-Laundry-Storage Building which will provide storage space for foodstuffs. The auxiliary service buildings are connected with the Clinical Center by a 9-ft.-wide tunnel for transportation of supplies by electric carts.

[1] Presented at the 33rd Annual Meeting of the American Dietetic Association in Washington, D. C., on October 19, 1950.

[2] Director, The Clinical Center, The National Institutes of Health, U. S. Public Health Service, Federal Security Agency, Bethesda, Maryland.

[3] Chief, Equipment Section, Public Buildings Service, General Services Administration, Washington, D. C.

### CLINICAL FACILITIES

The standard ratios of general hospital design were modified because the broad categories of disease to be treated in the Clinical Center focus on long-term illnesses, including cancer, heart, metabolic, psychiatric, neurological, dental, infectious, and tropical diseases. Moreover, the primary purpose of the Center is scientific investigation, as well as treatment. These factors create special needs in the feeding of patients and in the studies of nutritional problems in many types of diseases.

There are two nursing units on each floor. The typical nursing unit accommodates a maximum of twenty-six patients in thirteen two-bed rooms. Each floor has a branch kitchen-serving pantry to serve fifty-two patients. The ratio of bed-bound, semi-ambulatory, and ambulatory patients will vary greatly at different periods, depending on the phases of certain diseases under study. A dining room with a capacity of sixteen persons is situated in each nursing unit, for ambulatory and semi-ambulatory patients.

In addition to these installations, five special metabolic kitchens have been included—one on the seventh floor (allocated to the National Heart Institute) and two each on the eighth and ninth floors (allocated to the National Institute of Arthritis and Metabolic Diseases.)

In planning this laboratory-hospital, the key objectives were utility and flexibility to meet the ever-changing requirements of laboratory research, patient care, and administrative practices. In the last two decades, there has been much greater progress toward achieving flexibility in laboratory design than there has been in planning for nursing units and food preparation and food service facilities.

In working out the dietary services of the Clinical Center, emphasis has been placed on design for efficiency through partially decentralized food preparation and prompt food service. Likewise, stress has been placed on design of work areas and selection of equipment in keeping with modern sanitary engineering practices. The requirements of the U. S.

Public Health Service Eating and Drinking Establishments Ordinance and Code (2) are rigidly observed. Many of the recommendations of the First National Sanitation Clinic (3) are incorporated in the specifications.

### MAIN KITCHEN FOOD PREPARATION

The air-conditioned main kitchen (Fig. 1)[4] is situated at the ground level, adjacent to the staff cafeteria and immediately beneath the branch kitchen-serving pantries of the nursing-dietetic units on the upper floors of the fourteen-story structure. The lighting fixtures are the incandescent type, semi-recessed to be almost flush with the ceiling. The lighting arrangement furnishes approximately 25 to 30 footcandles, offering ample well-diffused light without glare or color distortion. The ceiling is covered with metal acoustic tile with an 85 per cent noise reduction coefficient.

The kitchen is 72 ft. wide and 200 ft. long, an area of 15,000 sq. ft. As indicated in Figure 1, the utilization of straight lines of food production flow design was affected by the multiplicity of thick supporting columns inevitably present in a fourteen-story concrete structure.

The greater part of food preparation for patients and all cooking for the cafeteria are done in the main kitchen. The layout is based on a plan for decentralized tray service for 500 patients and cafeteria service for about 2000 employees. The flow of work is planned on modern principles of kitchen design, from receiving raw food to completion of food processing and disposal of waste (4). The planners sought to achieve a smooth-flowing food production unit providing adequate space for each sub-unit and with minimal cross-traffic, ample refrigeration, and sufficient day stores. Guiding considerations were sanitation control, accident prevention, pleasant environmental working conditions, and ready access to equipment for servicing.

The bulk of food supplies is brought from the storage and supply rooms in an adjacent building via tunnel to the sub-basement level of the Clinical Center, then up to the kitchen level by two service elevators (Fig. 1) with door openings 5 ft. 3 in. wide. At the east side of the kitchen, there is also a loading platform and receiving room for direct delivery of certain foodstuffs by vendors. A kitchen storage room directly opposite the receiving room and adjacent "day stores" areas for staples and canned goods are planned for a capacity of three to seven days. Large quantity storage, as mentioned earlier, is in an auxiliary building.

Placement of the cooking equipment was influenced by the food preparation load of the cafeteria, which is much greater than the volume of patients' food. The ranges and fryers are gas heated. Ovens are electrically heated. The kettles and vegetable steamers are steam heated. There are no partitions between these items of equipment which might hamper supervision, cleaning, and maintenance. The exposed fronts of the ranges, fryers, ovens, and steamers are of corrosion-resistant metal.

In order to facilitate cleaning and vermin control, the fixed tables and sinks are located 4 in. from the walls. Each preparation area has a hand-washing lavatory. Toilets are situated in the far end of the

[4] Additional layouts showing in more detail the planning of the food service for the Clinical Center will be included with reprints of this paper which will be available from the authors.

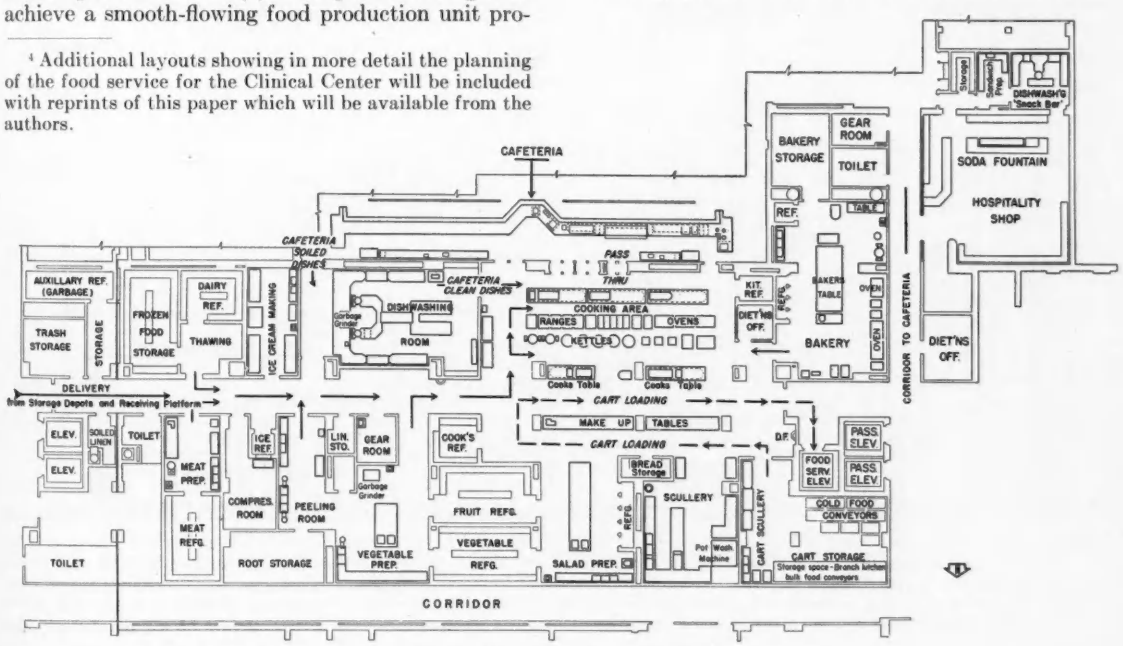


FIG. 1. *Floor plan of main kitchen*

main kitchen and adjacent corridor. Individual lockers, group showers, and recreation rooms are shared with other employees on the same floor.

Special drains were designed for installation under the kettles and vegetable steamers to produce a level floor throughout this section. The top grating of these drains is splash-proof and readily removable.

The bakery is a separate, enclosed area. Three separate electric sectional ovens provide flexibility and some protection against total breakdown.

The scullery is equipped with automatic pot-washing machinery and a milk can steam washer. An entirely separate scullery is provided in the cart storage section for the washing of insert containers of all food carts by a modified dishwasher. At the west side of the kitchen, there is a separate elevator installed for the exclusive use of the Nutrition Department for vertical transportation of food carts.

A flake ice machine and an ice storage bin are located in the kitchen for the use of the cafeteria and salad-preparation group. In an effort to reduce garbage disposal traffic, the main kitchen is also equipped with two 400-lb.-per-hour garbage grinders —one located at the vegetable preparation room and the other at the soiled dish reception point of the dishwashing area. These machines are mounted on resilient bases and housed in cases lined with sound-absorptive material to minimize noise of operation. As a standby facility, in the event of a temporary breakdown of these garbage grinders, a refrigerated garbage can storage area is available adjacent to the trash room, nearest the exit toward the tunnel leading to the incinerator in an auxiliary building 1000 ft. away.

One of the auxiliary buildings, the Boiler Plant-Incinerator, contains a baling press for the disposal of tin cans and cartons. Operating plans also call for the regular washing of refuse cans in this auxiliary building by a specially designed washer. Each can will be run through an automatic cycle of pre-flush, detergent wash, hot rinse, and steam spray.

Office space for the staff of the Nutrition Department is situated: (a) in the main kitchen (equipped with pneumatic tube station); (b) on the opposite side of the corridor adjacent to the kitchen and Hospitality Shop; (c) in the administrative area of the Clinical Center's first floor; and (d) shared space, accessible to a pneumatic tube station, in each nursing-dietetic unit.

### BRANCH KITCHEN-SERVING PANTRIES

The well-known difficulties of mechanical transportation of patients' trays from a central kitchen led to the selection of a decentralized food service system, with a branch kitchen (Fig. 2) on each floor planned on principles of efficiency in serving good food quickly. Floor area, design, and equipment in each branch kitchen-serving pantry are geared: (a) to the use of electrically heated food trucks from the central kitchen, and (b) to the local preparation of certain foods in order to provide selective menus and special diets. The branch kitchen has a telephone and also an intercommunicating system to the nursing station on the same floor.

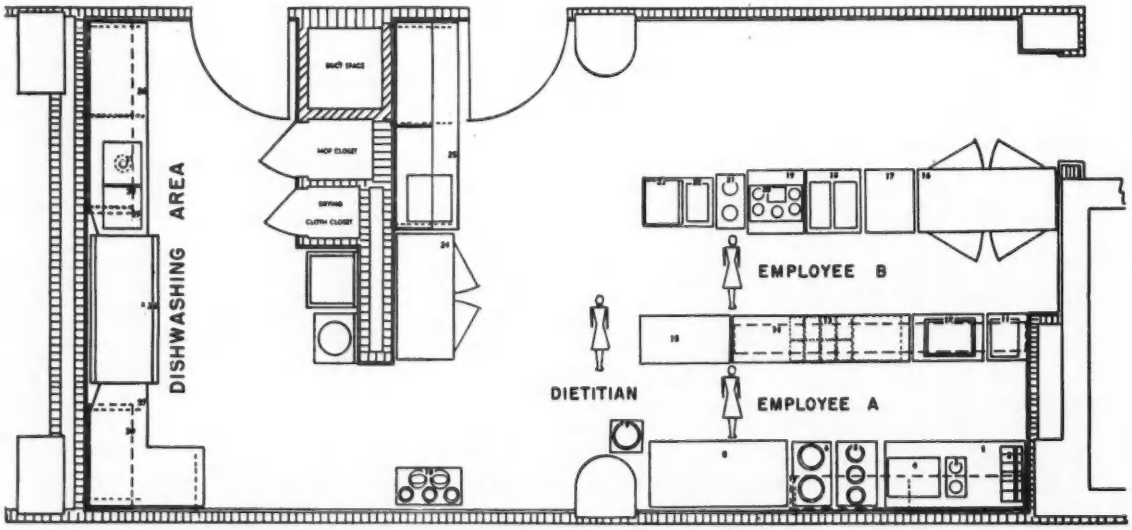


FIG. 2. *Floor plan of a branch kitchen-serving pantry. Employee A slides trays off dispenser to center table line and puts on tray cover, silver, and condiments. Dietitian calls selected cold foods which are gathered and placed by Employee B, who slides trays along center table. Dietitian calls selected hot foods which are loaded by Employee A, who moved down the hot food line. Dietitian calls beverages and bread which are served by Employee B, who pushes trays onto the even-level tray cart. Dietitian checks the trays, places meal cards and food covers, and dispatches the cart. Details vary somewhat with breakfast, dinner, and supper.*

| ROOM | DIMENSIONS | AREA | CEILING | | FLOOR FINISH | WALL FINISH | LIGHTING | VENTILATION | COLOR SCHEME† |
|---|---|---|---|---|---|---|---|---|---|
| | | | Height | Material | | | | | |
| Main kitchen | 200′ x 75′ | *sq. ft.* 15,000 | 10′ | Perforated metal tile—85% n.r.c. | Quarry tile; acid-resistant mortar in joints | Ceramic tile with corrosion resistant metal; corner guards around columns | Semi-recessed incandescent fixtures—30 footcandles<br>Vapor proof incandescent fixtures under hoods and in refrigerators | Air conditioned with exhaust hoods<br>Bakery: 6,000 c.f.m.<br>Cart storage: 1,000 c.f.m.<br>Scullery: 1,500 c.f.m.<br>Dishwashing: 4,000 c.f.m.<br>Cooking area: 20,000 c.f.m. | Walls: cream<br>Ceiling: white<br>Refrigerators: painted aluminum |
| Branch kitchen -serving pantry | 36′ x 17′6″ | 630 | 9′6″ | Perforated metal tile—85% n.r.c. | Quarry tile; acid-resistant mortar in joints | Ceramic tile with wainscot of corrosion-resistant metal around columns | Suspended fluorescent fixtures—30 footcandles | Air conditioned 900 c.f.m. supply. Exhaust:<br>Dishwashing: 800 c.f.m.<br>Cloth drying: 50 c.f.m.<br>Mop closet: 50 c.f.m. | Walls: 10 yr. 7/1<br>Doors: 2.5 yr. 6/4<br>Ceiling: white |
| Metabolic kitchen—"W-M" type | 26′ x 17′ | 442 | 9′6″ | Perforated metal tile—85% n.r.c. | Quarry tile | Ceramic tile to ceiling | Suspended fluorescent fixtures—30 footcandles | Air conditioned 1000 c.f.m. supply. Exhaust:<br>Range: 500 c.f.m.<br>Dishwashing: 300 c.f.m<br>Room grills: 200 c.f.m. | Walls: 10 yr. 7/1<br>Doors: 2.5 yr. 6/4<br>Ceiling: white |
| Metabolic kitchen—"R-W" type | 29′ x 21′6″ | 624 | 12′ | Perforated metal tile—85% n.r.c. | Quarry tile | Removable partitions (metal or asbestos); used throughout laboratory areas | Suspended fluorescent fixtures | Air conditioned 500 c.f.m. | Walls: 10 yr. 7/1<br>Doors: 2.5 yr. 6/4 |
| Refrigerated storage area in auxiliary building | 140′ x 100′ | 14,000 | 13′ | Concrete | Lobby: concrete<br>Corridor and office: quarry tile | Lobby: concrete<br>Corridor and office: structural facing tile | Industrial type incandescent | Tempered air supply to office of 720 c.f.m.<br>Exhaust through mechanical rooms | Wall: 10 yr. 7.5/1<br>Doors: 7.5 BG 6/2 |
| Refrigerators‡ | | | | Mastic material; aluminum paint | Quarry tile floor and base | Ceramic tile 6″ cork insulation in low temperature rooms; 4″ cork insulation for all other rooms | Vaporproof incandescent fixtures | | Aluminum paint |
| Snack bar | 36′ x 34′6″ | 1240 | 9′ | Perforated metal tile—85% n.r.c. | Terrazzo | Plywood wainscot and panel | Recessed incandescent fixtures; fluorescent cove lighting | Air conditioned 1500 c.f.m. | Walls: 5 GY 8/2<br>Doors: 2.5 BG 6/2 |
| Snack bar preparation area | 28′6″ x 13′ | 370 | 9′ | Perforated metal tile—85% n.r.c. | Quarry tile | Ceramic tile | Incandescent lights | Air conditioned 350 c.f.m. | Walls: 10 yr. 8/2<br>Doors: 5 BG 6/2 |
| Cafeteria | 110′ x 90′ | 9900 | 10′ | Perforated metal tile—85% n.r.c. | Quarry tile | Quarry tile base; ceramic tile wainscot<br>Columns have vinyl plastic sheeting | Recessed fluorescent fixtures with soft white tubes | 13,000 c.f.m. air supply through perforations of acoustic metal tile ceiling | Heather brown floors and walls with white wainscot<br>Walls: 5 yr. 8.5/4<br>Doors: 5B 6/4 |
| Food service elevator | Cab: 7′ x 8′4″ | Door 4′6″ wide; speed 600 ft. per minute. Signal operated (with optional manual operation) | | | | | | | |

* Fire protection: fireproof materials throughout, firehose cabinets and extinguishers at regular intervals, perforated steam pipe in main kitchen hood; automatic sprinklers in laundry collection room and trash room; automatic sprinklers in laundry chute and trash chute, and watchman report system.

† Color scheme indicated by Munsell Book of Color Figures.

‡ Separate refrigerating system for: (a) −10°F. rooms and (b) 32°–50°F. rooms, with one spare compressor; all compressors on ground floor; evaporative condensers in pent house.

In Figure 2 is illustrated the plan for the rapid assembly of trays on each floor under the supervision of a dietitian. It is recognized that the efficient functioning of these floor units will require careful training and intelligent supervision of employees with nimble fingers.

The egg-boilers, griddle, hot plate, coffee maker, and toaster permit flexibility in menu planning and enable the dietitian to furnish patients with freshly prepared and attractive dishes, especially eggs, flapjacks, ham, or bacon for breakfast—the most difficult and neglected of all meals. It is hoped that for all meals, the branch kitchen service plan also "will get appropriate food to the patient with the vitamins in the vegetables, the sizzle in the steak, and the steam rising from the coffee" (5). Consideration has been given to the possible installation of electronic heating units.

It is apparent that in the cart delivery of trays, the distribution time increases in proportion to the number of trays on each cart. Thus, an important factor in the rapid delivery of warm food and chilled salads to the patients (who already have been prepared by the nursing staff for mealtime) is the use of light, silent carts limited to four trays.

The branch kitchen-serving pantry will serve a maximum of fifty-two patients in both nursing units on each floor. The longest distance to be traveled by the tray cart for service to bed-bound patients is 220 ft.

From the main kitchen, carts for cold food (salads, milk, butter, desserts, and so on) are dispatched via the special elevator to the various branch kitchens. The refrigerator in the assembly line has adjustable shelving and is loaded through its back door, without the cart man's entering the branch kitchen. Racks for the cold food carts and refrigerator are interchangeable.

Similarly, hot foods in bulk are conveyed by preheated electric carts via special elevator just before mealtime to the branch kitchen on each floor. The special elevator is reserved exclusively for food services and is under the control of the Nutrition Department.

The chinaware is kept in dispensers, some of which are heated. All dispensers are on roller bearing casters for easy moving to branch kitchen dishwashing areas. Additional cabinet space is available for the storage of extra dishes and supplies.

As indicated in Figure 2, a refrigerator is on the left side, out of the assembly line area, with a 13-cu.-ft. section for food storage and special nourishments and another section for ice cube manufacture.

Facilities for local dishwashing have been installed in an enclosed section of the branch kitchen, with a separate entrance from the corridor. There are two pre-rinse sinks; the first scraping sink is equipped with a domestic-size garbage grinder with a spray head mounted on a flexible hose for scrap removal. Metal guides are inserted for steering the racks into a two-tank dishwashing machine. The air-dried dishes are loaded into the mobile dish dispensers.

Special closets have been developed for drying dish cloths and mops by means of heated air and a fan-operated exhaust system for removal of moisture and odors. A hand lavatory and service sink have been installed adjacent to these closets.

All equipment in the branch kitchen is of corrosion-resistant metal.

### *Modification in Radiation Wing*

One entire wing of the Clinical Center, extending three stories underground and five stories above ground, is to be devoted to research on the biologic effect of ionizing radiations. The research program will be concerned with the expansion of the usefulness of radiotherapy (external and internal) and the improvement of the use of radioactive isotopes as diagnostic tools (e.g., the use of "tracers" in metabolic investigations) (6). The design and construction of this wing raised many problems in shielding, ventilating, plumbing, equipment, and floor surfaces. All available data have been applied to insure the greatest possible safety for personnel and patients. Rigid enforcement of safety regulations will be the responsibility of specially trained personnel.

The second and third floors of the Radiation Wing each contain eleven single rooms for patients. The typical branch kitchen-serving pantry design has been modified. The cold and heated food carts do not enter the wing, but are delivered to an alcove just outside the control doors to the patients' unit. The inserts are taken from the cart and handed through a pass window.

The decontamination procedures for dishes and silverware are determined by the nature of the research and treatment program, subject to careful scrutiny by the radiation health monitors.

### *Modification in Infectious Disease Unit*

The operation of the branch kitchen in the unit for the care of patients with infectious diseases requires some modification of the normal pattern. Each of the thirteen rooms in this nursing area is a self-sufficient unit, permitting the concurrent investigation and treatment of several types of communicable diseases. Personnel in contaminated gowns, masks, and caps are restricted to the bedroom in order to reduce the possibility of contamination of the corridor. Special problems in the feeding of patients with infectious diseases will necessitate complete cooperation between nursing and dietetic staffs, together with an in-service training program including special instruction for dietary employees in this unit.

## METABOLIC KITCHENS

Several constituent units of the National Institutes of Health will be engaged in extensive research on

problems of metabolism. Because of the significance of controlled diet to these studies, special metabolic kitchens are planned. A review of the literature offered only limited guidance in their design. Inspection trips to many hospitals revealed that metabolic units were usually improvisations of existing space and facilities. Although such kitchens furnish food to only four to eight or twelve patients, depending on the problem under investigation, the space and equipment requirements cannot be scaled down accordingly. These special floor service units must provide for the meticulous preparation of carefully analyzed foodstuffs.

Two types of metabolic kitchens are planned. Type "W-M" is located in the center line of service rooms. Type "R-W" is situated on the north side and represents an interesting example of adaptation of clinical investigation laboratory space.

In Figure 3 is illustrated the "W-M" type of metabolic kitchen. The problem is to provide space and equipment for specific individual tray requirements, rather than production flow. Capped plumbing connections for the installation of a small vegetable steamer are provided in the event that small individual pressure cookers do not meet future needs. Ample table top space, including a central island table, is furnished for scales and individual tray preparation by the metabolic unit staff workers. Liberal storage space is required for bulk raw food to be analyzed for chemical content and used during the course of the investigation. A large closet for food storage, a 25-cu.-ft. refrigerator, and an 8-cu.-ft. frozen food cabinet are furnished.

Dishwashing equipment is on the right side wall. The soiled dish table contains a sink and garbage grinder. A distilled water line from the central distilled water supply is available at the sink for final rinse of dishes and glassware.

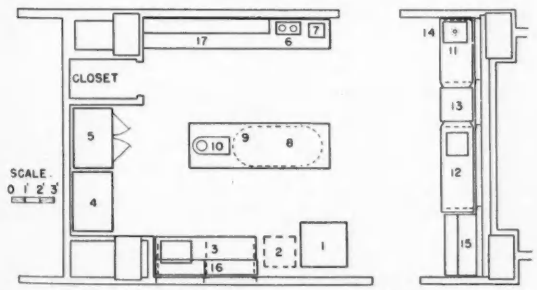


FIG. 3. *Floor plan of "W-M" type metabolic kitchen*

LEGEND

1. Range
2. Future vegetable steamer
3. Table
4. Frozen food refrigerator
5. Refrigerator
6. Coffee maker
7. Toaster
8. Table
9. Pot rack
10. Mixer
11. Soiled dish table
12. Clean dish table
13. Dishwashing machine
14. Garbage grinder
15. Counter and cabinet
16. Cabinets
17. Counter and cabinets

The "R-W" type of metabolic kitchen is designed according to flow lines of tray service for patients on relatively more standardized diets in special studies.

It is believed that the use of two types of metabolic kitchens will provide comparative data of value to future design in this highly specialized field.

### CAFETERIA

There is only one cafeteria in the Clinical Center—one immediately adjacent to the main kitchen, with 10,000 sq. ft. providing a seating capacity for approximately six hundred people. The entire south wall of the cafeteria opens onto an outdoor terrace at ground level. About two thousand professional and staff employees will be served in this cafeteria, and a single standard of food service will be maintained for all employees. Accordion partitions can be installed when the need arises to separate one area for luncheon or dinner meetings of small staff groups.

Pass-through warming cabinets and chilled cabinets between the cafeteria back bar and the kitchen will expedite the delivery of prepared food to the counter.

The air conditioning of the cafeteria is entirely separate from the kitchen. Attractive soft-colored tile, combined with vinyl plastic wainscots, have been used to afford a pleasant, comfortable dining room.

The arrangement for dishwashing is illustrated in Figure 1. The large dishwasher is equipped with an electronic detergent dispenser control.

### HOSPITALITY SHOP AND SNACK BAR

A Hospitality Shop with a soda fountain-snack bar is situated opposite the cafeteria. A seating capacity of eighty will furnish auxiliary food service at all hours for the staff and visitors. Separate food preparation and dishwashing areas are installed to permit independent operation of this area, if desired.

### REFRIGERATED FOOD STORAGE

The Shops-Laundry-Storage auxiliary service building contains extensive storage space, including refrigerated rooms, under the control of the Nutrition Department. The total amount is in excess of standard ratios in order to provide for: (a) the sudden expansion of patient care facilities in emergencies, and (b) the trend toward greater use of frozen food products.

Very large quantities of food requiring refrigeration can be stored in this area under careful supervision, for delivery by tunnel to the main Clinical Center building.

In Figure 4 is illustrated the storage room layout for various items, such as meat, fish, dairy products, fruits, and vegetables. The relationship between rooms and corridors (which are 8 ft. wide) permits future flexibility in the rearrangement of cold storage space for the different types of food. For example, the

meat section includes space for prefabricated meat cuts, carcass meat (with cutting equipment), and smoked meat, which gives a wide choice of arrangements for large-quantity purchases. An ice-making machine and an ice storage room are located in this area to pack fresh fish and poultry. Space is allocated for a separate ripening room for fruits and vegetables. Separate rooms are also provided for trash storage and for crates of empty milk bottles awaiting return to the dairy. Separated from this area, but easily accessible, are the janitors' closets, toilets, and hand-washing basins.

Refrigerator floors are at the same level as corridor floors, with a very low threshold to permit easy trucking. Floor drains are located in the corridors. Defrosting drain pipes extend through the refrigerator walls and discharge 1½ in. above the floor drains.

The delivery and storage supervisor's office is centrally located, with large window areas on three sides for control of incoming and outgoing deliveries and storage rooms. A wrapping counter is provided for small items.

The incoming delivery platform is at grade level. There is a large lobby for the inspection and weighing of deliveries. Outgoing delivery to the Clinical Center is by electric truck via the service tunnel.

This auxiliary storage building also contains ample non-refrigerated space for other food staples.

## CONCLUSION

It is expected that the Clinical Center structure will be completed in the latter part of 1952. It will represent an important asset in the attack on the disease groups which constitute the major causes of death and disability in our country. The well-known relationship of nutrition to the recovery of patients assumes special importance in treating patients with long-term illnesses and infectious diseases. The feed-

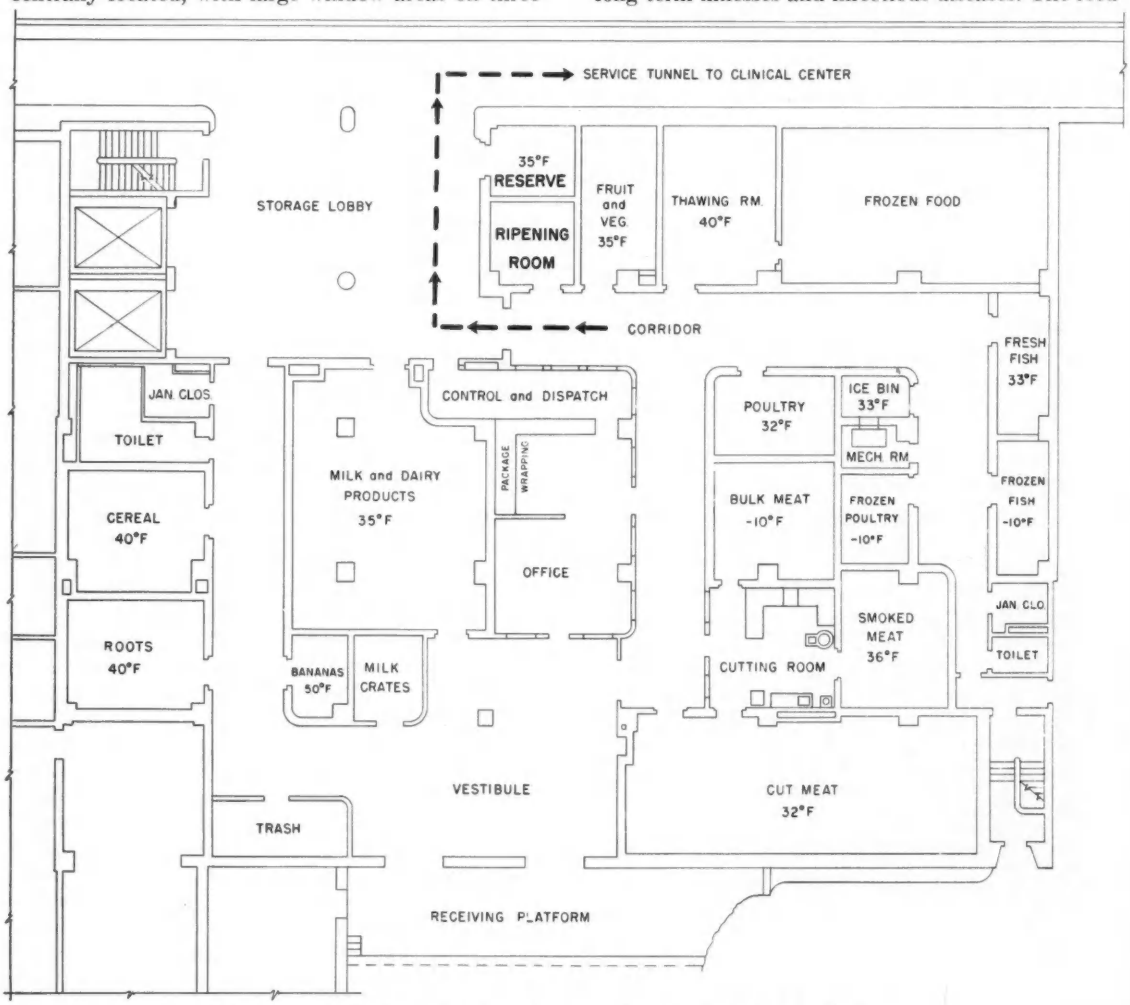


FIG. 4. *Layout of cold storage rooms in shops, laundry, and storage building*

ing of hospital patients with chronic diseases involves many psychological considerations which are a challenge to the ingenuity and resourcefulness of the skilled dietitian.

These considerations, together with the variety of clinical research programs at the National Institutes of Health, will provide unique opportunities for the skilled dietitian to participate as a member of the research team in studies on psychiatric and neurological diseases, cancer, heart diseases, metabolic diseases (including arthritis and rheumatism), infectious and tropical diseases, and dental diseases.

ACKNOWLEDGEMENTS

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## NEW USES FOR MILK SOLIDS

*Improving Skim Milk for Beverage Use*

Under the Research and Marketing Act, the Bureau of Dairy Industry is conducting research to develop new products which will make possible an increase in the use of nonfat milk solids.

One promising development has resulted from adding extra nonfat solids and some butterfat to skim milk to form a high-solids, low-fat beverage, containing 11 per cent nonfat solids and 1 to 1½ per cent butterfat. Regular whole milk contains about 9 per cent nonfat solids and 4 per cent butterfat. Palatability tests made by the Bureau have shown this milk to be acceptable; other tests by a few commercial processors who have made a milk similar in type have indicated consumer acceptance of the beverage. The high-solids milk contains fewer calories and more protein and milk sugar and is usually sold at a lower price than whole milk.

In the course of these studies, the workers observed that skim milk has a higher curd tension and therefore may be less digestible than whole milk. In an effort to overcome this difficulty, they subjected skim milk to various heat treatments. They found that when skim milk was heated to 180°F., there was a rapid drop in curd tension as the holding time increased. Curd tension was practically zero after a 30-min. heating at 180°. Although the heat treatment necessary to produce a soft-curd milk (180° for 5 min.) is higher than normal pasteurization temperatures, the milk did not have an objectionable cooked flavor.

*Improving Baked Goods*

Another project under the Research and Marketing Act has been an investigation by the Bureau of Dairy Industry of the use of milk and milk products in the manufacture of bread and other baked goods. The purpose of such work was to determine the specific advantages of adding milk to baked products and to promote an increased use of milk in them.

The research has shown that milk solids can be used in practically any type of baked goods and that the addition of milk will improve the physical properties of the products as well as their nutritional value.

Bread containing 6 per cent milk solids, based on the weight of the flour, had better interior and exterior characteristics than bread made with less milk solids or no milk, at all. There were fewer and more uniform air holes, and the bread has a softer and more silky texture and a more attractive internal appearance, as well as more desirable toasting and eating qualities. The loaf was bigger and more symmetrical and had an appealing, golden-brown crust. These improvements were apparent regardless of the source of the milk solids.

Related work demonstrated the usefulness of fluid whey, plain and sweetened condensed whey, and dried whey in sweet baked goods. The use of 6 to 12 per cent whey solids, based on the weight of the flour, produced a soft, cakelike texture and an attractive brown crust, and prolonged shelf life of sweet baked goods.—*From Report of the Chief of the Bureau of Dairy Industry, United States Department of Agriculture, 1950.*

# Dietary Consultation—A Service for Small Institutions

## VII. Employee Training—A Part of Personnel Management

**Compiled by Grace McMahon[1] for the National Committee of the Community Nutrition Section[2] of the American Dietetic Association on Preparation of a Manual for Use in Dietary Consultation Service to Institutions without Trained Food Service Personnel**

SO MUCH has been written about employee training as a part of personnel management that one authority states (1): "In industry, as in society generally, education is the great panacea; and training is counted upon to perform miracles in many cases." During the war, the programs of employee training were geared to maximum efficiency aided by the single aim of winning the war. The Training Within Industry (2) program, planned principally for large industries, made organizations all over the country conscious of the importance of training the worker and the supervisor and of the relationship between the two.

Consulting dietitians who have worked in both large and small institutions realize that the problems of training are quite different. Much material is available for the larger institutions (3–19). Their problems are more complex. They train a sizable number of persons to do specialized tasks, and the importance of this training can be easily understood. Although it requires time in planning and supervision, the savings, including the increase in workers' efficiency and morale, have made it worth while.

There is not, however, much literature available on training in small institutions (20–21). Many small institutions which are efficient in their operation have probably never had time to put their methods in written form. Then, too, in the small institutions where only one employee does a given job, the teaching is on an individual rather than a group basis.

In the recent survey (22), consulting dietitians in the field reported that the number of requests for help with personnel problems was small. Rather than self-sufficiency, however, this may indicate a lack of awareness of the importance of training. Even so, those who feel a need for employee training may be at a loss to know how to initiate it.

The purposes of this discussion are: (a) to recognize and consider the problems of consultation service in employee training as a part of personnel management and (b) to provide a critical bibliography consisting of two types of source material: the first, selected references to provide the consultant with new and pertinent material to help her evaluate and meet her problems; and second, references to material that can be distributed to institutions.

When the consulting dietitian considers employee training, the following are facets of the overall problem: labor recruitment, employee selection, training in techniques, and employee records.

### LABOR RECRUITMENT

The problem of training is so intermingled with that of recruitment and selection that a discussion of one is not complete without the other. Much time may need to be spent first on proper labor recruitment before selection and training can be started (23).

Successful recruitment depends on having available a sizable labor force in order that employees may be selected who have potentialities of being efficient and productive. The competition in the

[1] The advice and counsel of the following people is gratefully acknowledged: Mildred Bonnell, Felisa Bracken, Mary Ellen Dambold, Margaret B. Dreisbach, Mary Griffin, Clarice Gullickson, Jane Hartman, Marjorie Heseltine, Edith Holt, Helen Hunscher, Cora Kusner, Rosalind Lifquist, Juanita Cochran Miller, Mary W. Northrop, Helen Phaneuf, Hazel K. Stiebeling, Frances Swenson, E. Neige Todhunter, and members of the Executive Board and staff of the American Dietetic Association.

[2] Members of the Committee were: 1946–48—Margaret Walsh, Chairman, Magdalin K. Espy, Elizabeth Perry, Theresa Powers, Wilma Robinson, and Pearl Rorabaugh; 1948–49—Adelia M. Beeuwkes, Chairman, Magdalin K. Espy, Elizabeth Perry, Mary Agnes Pohl, Wilma Robinson, Pearl Rorabaugh, and Jane Sedgwick.

labor market must be watched closely, for institutions must provide a level of wages, both monetary and non-monetary, that will attract the employees they desire. It is advisable for the consulting dietitian to keep in contact with various sources of information in order to visualize the type of employee who can be commanded at a given wage. The United States Employment Service will be able to supply valuable information along this line, and informal contact with local stores, places of business, and domestic hiring agencies may yield facts which will make possible a comparison of wage scales and other employee benefits of the "going" market with those of the institutions she helps. If there is too much disparity, the consultant may even feel it necessary to recommend changes in policy before a productive recruiting program can be instituted. Saum (24) has discussed the fundamentals of job evaluation on which an equitable salary program can be based.

But, assuming that working conditions in the institution are on the community level, finding workers of a desirable caliber is still a problem, and various sources should be used. The United States Employment Service and domestic hiring agencies mentioned above are, of course, the first sources which come to mind. However, the person responsible for hiring should not stop there. The use of community resources is necessary in most cases. The help of the state home demonstration agent or home advisor may be enlisted to bring out possible employee talent in rural areas. High schools, the Y.W.C.A., churches, and women's clubs may also be fertile sources. In fact, people are reached through these channels who would not consider answering a newspaper advertisement or asking for the help of an employment agency. Other sources of labor may suggest themselves automatically if the specific needs of the institution are defined in terms of age, sex, and education of employees. For institutions in sparsely populated, inaccessible locations, the consultant may need to emphasize advertising to the right labor source through rural newspapers.

With the entrance of women, handicapped persons, and older workers in large numbers into the labor market during the war, a new source of labor was tapped. These workers revealed superior qualities and many have continued working or would like to continue. They constitute a "plus" in the labor force on which it may be advisable to draw.

Another factor which may need to be considered in relation to labor procurement is transportation. If transportation is provided by the institution, there is the additional problem of scheduling hours.

The demand for persons who have been previously trained in the skills necessary for the preparation and service of food in quantity is naturally greater than for untrained personnel. If such persons are available, training problems will be lessened. However, where the need for experienced or trained workers is greater than the supply, some training courses can be sponsored by various groups and organizations, such as the local or state dietetic, hospital, and restaurant associations (25–30). There are also a few technical schools and vocational high schools in the large cities in which some types of training can be obtained, for instance, the preparation for cooks and bakers. If a contact can be made between these schools and the institutions needing trained employees, the value of the vocational training would be realized in immediate employment.

### EMPLOYEE SELECTION

After recruitment comes the equally important task of selection. The consulting dietitian may find that she can make only limited suggestions concerning policies of selection because they usually involve the policy of the entire institution. The responsibility for personnel administration is quite heavy for the institution's administrator who understands more than anyone the total complex problems. However, any assistance in maintaining a smoothly running organization at lower cost will no doubt be welcome. The cost of poor selection of employees is often overlooked in the great cost of entire labor turnover, although by proper selection, turnover can be reduced.

The consultant may need to review the institution's present practices of selection to determine whether the best persons available are hired for given positions. Perhaps the duties listed under certain jobs should be re-defined to fit the characteristics of the person obtainable for the position. In small institutions, there may be little opportunity for choice in selection, but placing the available persons in the most logical positions and then subsequently transferring them to other positions if more suitable openings occur promotes greater employee-employer satisfaction (31–35).

Although employee selection has been reduced to a scientific procedure in large organizations, these methods cannot be applied *in toto* in most of the institutions discussed here. However, if the administration realizes the difference between what a person *can* do in relation to what he *will* do as well as the importance of placing a person in a position that will challenge him sufficiently (32), a better employee organization can be developed.

### TRAINING IN PERFORMANCE TECHNIQUES

After the best available person has been selected for a specific job, the process of training begins.

Although many small institutions have no one person responsible for the complete operation of the dietary department, it is the feeling of those who have had experience in consultation work that one of the first needs of many organizations is the appointment of a supervisor. Through this supervisor,

suggestions of the consultant can be channeled, and the program of training can be made more effective.

One of the initial steps in a training program is to develop proper standards for work as well as for the finished product. Such standards are like yardsticks; they are measures of comparison. As one consulting dietitian says in one of her directives (36): "Determine *what* you want done and *how* you want it done." Some help on this problem may be obtained from industrial management engineers who have studied the work in hospitals (37–41). They have explained that in simplifying a job, there are essentially five steps: (a) picking the job to be improved; (b) breaking down the job in detail; (c) questioning each detail; (d) working out a better method; and (e) putting the new method to work. In working out a better method, they suggest that a job be scrutinized to answer the following questions: can it be eliminated? can it be combined? can the sequence be changed? and can it be simplified? After these questions have been answered and changes planned from the knowledge gained, there is still the problem of overcoming employees' resistance to change.

If the consulting dietitian can provide standards of procedure and technique for the major groups of duties found in an institution, the employees will have some guides for their work habits. While the general classification of duties for each institution may differ slightly, in the main they will fall into the following groups:

(a) *Food Preparation.* Methods of preparation which provide maximum nutrition and palatability are needed in many institutions. Reference to helps on this subject were presented in a previous article (42). This also included a discussion of food storage.

(b) *Sanitation and Dishwashing.* Procedures needed to maintain maximum sanitation involve constant teaching and supervision (43–44). References on this subject have been presented in the article on sanitation (44).

(c) *Housekeeping.* Methods of cleaning walls, floors, and windows may be needed. There are instructions for these tasks in the forthcoming housekeeping manual to be published by the American Hospital Association.

(d) *Care and Use of Equipment.* The companies which manufacture equipment can usually provide clear instructions for the maintenance and operation of their own equipment. Other sources of data could be used for listing clear directions (4, 45, 46).

(e) *Correct Procedures for Tray, Counter, and Waitress Service.* Each of these procedures will differ according to the institution. The consultant will realize that probably one procedure is required more than the others. Some instructions have been written for tray service (36), counter service (47), and waitress service (48). It would be necessary to adapt these suggestions to the needs of the particular situation.

The development of correct standards of procedure will take time, for too many new ideas cannot be introduced at once. Constant refresher methods are needed to insure continued good performance. The teaching of Training Within Industry (2) was effective because of showing and telling.

Usually formal classroom instruction is not possible in small groups except for general subjects of interest to all, such as sanitation or courtesy. If it is possible to bring persons doing similar tasks for different organizations together, the time spent in group instruction usually proves worth while.

The directors of school lunch programs in cities have conducted schools for their employees (49). Such classes have been held prior to the opening of the schools in the fall and at weekly intervals thereafter. Dietetic associations and home economics organizations have sponsored schools and institutes for food service employees scattered over certain areas, and who were able to convene in a central location (25–30). These courses have helped to train persons already employed in food service operations.

The frequently used method of asking an old employee to teach a new one is not efficient, but it is a rare small institution which has enough supervisory personnel to permit anyone to spend even the minimum of a day or two to teach a new employee. There may be no alternative than to use old employees to show the new, but those selected to teach should be carefully chosen, for the attitude of the old employees toward the new influences the speed of orientation and training. If the old employee's attitude is patient, the early anxieties of the new employee will not be so great, he will be more at ease, and the work will be learned more quickly.

Where old employees teach new ones, written instructions may help to prevent too many deviations from prescribed procedures. Perhaps the consultant can assist in developing written procedures for a particular job which will serve as a guide to the newcomer. Also, since the consultant is not available to see that a procedure is carefully followed, written instructions can serve as a "substitute" supervisor.

Visual aids which can be used as indirect tools for teaching in her absence are also helpful. These include posters telling how to do tasks simply and correctly. Films, although a pleasant means of instruction, should supplement rather than replace more direct methods of training. Sources of films, as well as film catalogs, are listed in the bibliography (50–52).

### EMPLOYEE RECORDS

Present day tax and compensation laws require an increasing number of records. In institutions where little has been recorded concerning employees or their tasks, the consultant may need to decide what basic information is essential to maintain smooth operation. Records should provide the exact type of information needed. Unless a form answers a definite and specific need, it should be discarded.

In advocating the use of new records, the consultant may encounter resistance to any type of record, especially in cases where almost none have been kept. This resistance can only be overcome by proving the worth through use of a few new records at a time.

If possible, the consultant should encourage the keeping of records, at least as to dates of employees' tenure and performance record while they were on the job, if only as a matter of protection for the employees. Since executive personnel may change, requests for references may be impossible to fill unless such information is filed in the institution. This information is also valuable in determining a fair basis for wage increases.

It is not possible in most instances to have detailed job descriptions and schedules of positions, unless there is a supervisor who can assume this responsibility. There is, however, a minimum amount of detail which should be recorded to insure smooth operation. One consulting dietitian has drawn some simple forms to guide untrained persons. They include: (a) listing of jobs and hours in the dietary department; (b) suggested general regulations for dietary employees; and (c) hospital employee regulations (which affect dietary employees [36]). The last two are especially valuable in orientation.

Encouraging the compilation of a "booklet of reference" to be kept in the kitchen might be helpful. In this, a record of all of the routine tasks which need to be done and the times when they should be finished would be a help in emergencies. It might, for example, help to record such facts as the amount of coffee usually made for breakfast or the amount of cereal required, since time is usually at a premium when emergencies occur—and there are emergencies quite frequently in institutions operating 24 hr. a day every day.

In the very small hospital, the dietary employee may not have a specialized job. In this case, it may be more important to make the employee feel that he is part of the whole and that he is there to assist with whatever needs to be done at a given time than to provide strict job analysis. Where such a feeling of unity and cooperation already exists, schedules and job descriptions might destroy the organization completely. The consulting dietitian must decide the wisest advice in each instance.

### ADVANTAGE OF THE SMALL INSTITUTION'S PERSONNEL PROGRAM

It is well known that, in addition to the formal organization, in any employee group there is an informal organization built up by the natural relationship of feelings of one employee to the other. These feelings influence the employee satisfaction, and knowledge of the informal organization is important if any effective improvement is to be made. As Glover (53) has pointed out: "An administrator must be constantly aware as he works with his group that his organization is a social group with its customs, its own traditions of social status. He must be sensitive to the group feelings of solidarity which hold his group together. He must realize that, whatever he says, certain informal tribal chieftains will emerge, claim, and receive the allegiance of the members of the group. Some of these people have no explicitly recognized position in the organization, but they frequently take the initiative and propose ideas which are accepted by the group. The administrator must accept their position. He must also recognize that the society of which he is the titular head will make its own provisions and that often the provisions which the group develops by itself may be more binding and more real than any regulation or rule he may promulgate. A desirable equilibrium may also be promoted by making sure that the written laws, rules, and regulations, the formal division of labor, manual and organization charts correspond to the unwritten laws, rules and customs of the 'tribe.' "

The small institution has problems quite different from those of large institutions which also give it some advantages in its personnel relations. The very matter of size makes the group more informal. There is not the great distance between the top administrator and the tray service girl, for example, that is found in the larger organization. Each employee is known personally. Furthermore, each employee may be known in the surrounding community. He feels he is the representative of that institution in his community and, therefore, feels a loyalty and responsibility in his job that is not always found in the employees of the larger organization.

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# Editorial

## THE PROFESSIONAL GROWTH OF THE DIETETIC INTERN[1]

Recently, I asked the head of one of our large departments in the Division of Science at Iowa State College—a man who has taught both undergraduate and graduate courses: "How do you change the attitude of an undergraduate student into the professional attitude you expect a graduate student to assume?" He said, "We sit down and talk it over with him." We talked further and decided there were at least two important factors in the development of a more mature, professional viewpoint: first, a difference in attitude of the graduate faculty as compared with that of the undergraduate staff, and second, a difference in method of teaching, i.e., the difference between pouring information into the heads of the undergraduates versus showing them how to get information themselves, digest it, and use it as leaders need to do.

Let us discuss first the attitude of the members of the staff. I know and you know that there are graduate faculty members in our colleges and universities who are teaching advanced undergraduate courses, not graduate courses: there is a difference. Perhaps students need a sharp break, the kind many experience when they enter college—a real jolt. One technique might be to question a statement in a recognized authoritative text. It might be found that the statement has been disproved, or the class may decide the text is correct. Repetition of that technique should engender a critical attitude. But even this is not enough: we need to take the next step and say, "If this is not true, where is the truth?"

The second point is a change of the student's method of acquiring knowledge. Students at the graduate level, if not before, should learn to realize that a text is second hand information and that fallacies are perpetuated from one text to another. One of the most common types of fallacies in textbooks is the presentation of a value as constant, when it may actually be quite variable, and normally so. Both the fields of medicine and nutrition are guilty of uncritical acceptance of unproved opinions. We, as well as our students and interns, need questioning minds.

Have you read *The Peabody Sisters*? If so, you will recall the diet one sister recommended to another as the best diet for pregnancy. The average woman today would know that the "white diet" discussed in this book would be about the least nutritious selection of foods which could be made. And the time of these sisters wasn't so long ago. This small story illustrates the colossal changes which have occurred in nutrition and are taking place. We cannot afford to accept textbooks as sources of our knowledge if we are going to be leaders in our profession. We must know current developments and changes. We need to *think*.

You must all be aware at all times that you and your staff are presenting to your dietetic interns the need for critical and original thinking in applying nutritional principles to the practical needs of your work. You and your staff have practical experience in the application of theoretical information—experience to justify and substantiate a critical and questioning viewpoint. An example might be taken from the *theory* of personnel management learned in college and the *practice* to which you introduce your interns—practice they could not obtain in their college courses. You are qualified in their eyes to do this.

This means that every staff member must keep up with the rapidly advancing fields represented in our interests, not only in nutrition and diet therapy, but also in administration and in the methods and means of imparting our knowledge to others.

Development in our interns and in ourselves of a critical attitude of mind and of the qualities of leadership requires constant and vigilant stimulation. To your interns you are not only a representative of a profession and of a professional viewpoint which I think is generally recognized as one of your functions as an internship director, but you also constitute an example of professional development, of continual individual improvement.

In the "Principles of Professional Ethics" prepared by a Committee of the American Dietetic Association, I think there has been a serious omission. In the last sentence under the heading "Standards of Professional Conduct" this statement occurs: "Professional skill, honesty, good judgment, poise, and human sympathy are the necessary qualities for a worthy and successful member of The American Dietetic Association." This is the only admonition about personal, individual development, and it is only there by implication. Professional skill in any phase of our profession depends on continuous, individual development. Good judgment in appraising many aspects of the application of the science of

[1] Presented at the Conference of Directors of Approved Dietetic Internships held in Washington, D. C., on October 15, 1950.

nutrition is absolutely dependent on the newer knowledge of nutrition, even though the work of a dietitian or nutritionist may be the teaching of children in a clinic or food production. We must be able to translate our knowledge into practical action in the situation in which we find ourselves. Your standing and that of your staff with your other professional associates in the medical field depends upon how well you are "keeping up." The members of the medical staff know which dietitians are capable of working with them on therapeutic or nutritional aspects of their research. Interns are not slow to measure the staff, not only in the area of nutrition but also, for example, in administration. How, for example, are the administrative dietitians measuring up in training employees, in efficiency studies, or in delegating duties? How can we teach interns to develop themselves, unless most of that teaching is done by precept?

The teaching of facts is one type of teaching, and we must all do some of it. Teaching professional ethics, or developing the professional viewpoint in others, is in part at least—perhaps in large part—a matter of precept and example. The head of the science department of whom I spoke earlier cannot, as he said "talk over with the student" development of a broader viewpoint and make any impression, if he does not himself exemplify the habit he expects of his graduate student—the habit of ferreting out information for himself and appraising what he finds. Only as *each member* of an internship staff is an example of a high standard of professional attitude, an example of continual individual development, a leader to whom the interns can look with respect and with a desire to emulate, can we teach such standards.

Now how should theory be translated into practice? I am humble when approaching this point, because I cannot tell anyone how to do it. Each of us must figure out how, in a life already too full of too many activities, we can do the reading we know we should do. Probably the way to do it is to look at ourselves and our lives objectively, trying to see how someone else might point out the unnecessary things we do. Establish the goal and then determine how the most important things can be placed first. We need the *habit* of doing what we have decided are the important things. In his little booklet, *A Way of Life*, William Osler says, "Once the mental habit is established, you are safe for life." I add to that, desirable habits must be nurtured.

Something Katherine Mitchell Johnson said in an article is apropos here: "The American Dietetic Association is not an inanimate object; it is made up of its members and the record of its achievements is the mirrored reflection of the caliber of those members." (You can see that I have inserted that sentence for my own stimulation, rather than yours.)

When all is said, it is not entirely what your associates and your interns may think of you which drives you on: personal satisfaction is a factor which is at least as important. The satisfaction of doing a job to the best of one's ability and the satisfaction of knowing that one is developing oneself are real. Such satisfaction is what distinguishes a profession from manual labor.

Guiding the interns under your supervision so that they will have started on the road toward being professional persons and being able to emphasize that guidance by personal example are goals worth striving toward each day. Each night we should each of us be able to say, "that habit of spending 20 minutes each day in reading—adding to my knowledge—has worked for another day." Each morning, let us say:

For Yesterday is but a Dream
And Tomorrow is only a Vision;
But Today well lived makes
Every Yesterday a Dream of Happiness,
And every Tomorrow a Vision of Hope.

Look well therefore to this Day!
Such is the Salutation of the Dawn!

—*Lillian Storms Coover, Ph.D., President, The American Dietetic Association.*

### Vitamin $B_{12}$-Active Materials in Milk Aid in Utilization of Protein

In investigations of the sources of vitamin $B_{12}$ in milk, the Bureau of Dairy Industry, U. S. Department of Agriculture, found that some rats can synthesize vitamin $B_{12}$-active materials microbiologically when they are on rations consisting almost entirely of plant products. These results tend to support the view expressed previously, which was based on strong circumstantial evidence, that the cow also is able to synthesize vitamin $B_{12}$-active materials which she secretes in her milk.

Other phases of the study showed that vitamin $B_{12}$ is effective in improving diets that are low in protein, as well as being effective in enabling rats to use rations that contain high levels of protein. Without a source of vitamin $B_{12}$, high levels of protein were found to be very harmful, and even fatal.

Vitamin $B_{12}$ was also shown to be essential for normal growth of rats when the ration was high in lactose (milk sugar). The depressing effect on growth, when the diet contains lactose but lacks vitamin $B_{12}$, appears to be due, in part at least, to suppression of microbiologic synthesis of this vitamin in the rat.—*From Report of the Chief of the Bureau of Dairy Industry, U. S. Department of Agriculture, 1950.*

# Current Comment

## FOOD PROBLEMS OF CIVIL DEFENSE

The government's official recommendations and blueprint for state and local, civil defense and health services were released by the Federal Civil Defense Administration on December 27, 1950, in a book, *Health Services and Special Weapons Defense*. This report elaborates the general outline previously released under the title *United States Civil Defense*.

The organizational plan for civil defense on the local level provides for a city civil defense director, under whom would function nine services, of which two, the Welfare Service and Health Service Division, would be concerned with food in time of disaster. Under the Health Service Division will be a Medical Services Branch which will have included in its responsibilities the operation of hospitals following a disaster; under a second branch, the Public Health Services Branch, both a nutrition unit and a sanitation unit will operate. Only a general plan of procedure for the Welfare Service has been released in United States Civil Defense.

An understanding of the planning to date is vital to every dietitian if she is to play her part in the event of atomic, biologic, or chemical warfare. Emergency feeding of populations would be a major problem after such a disaster, and considerable attention has been devoted in these two publications to ways of meeting the problems of: (a) hospital dietary services, (b) mass feeding, and (c) food and water contamination.

The following discussion is a compilation of the information pertaining to food given in these two government books. It is stressed that plans for handling a wartime disaster must be made on the assumption that no help from military personnel, equipment, or supplies would be available.

### HOSPITAL DIETARY SERVICE

Hospitals are the focal points of civil defense, and as such they will operate under the Medical Services Branch of the Health Service Division. It is pointed out that there will be three types of hospitals: existing general and special hospitals in the immediate vicinity of the disaster which are still usable; improvised hospitals or converted non-hospital buildings, i.e., schools, hotels, and tent hospitals; and hospitals in surrounding areas.

Estimates indicate that perhaps only half of the hospitals in an area would be usable after an atomic attack. Thus, because of the necessity for mass treatment of casualties plus the decrease in facilities, normal standards of care cannot be expected. Hospitals are urged to plan ways and means of expanding to the greatest possible capacity, with plans based on essential peacetime operating data.

The hospital dietary department would provide prompt emergency food service to a large number of casualties, hospital personnel, and volunteers. Certain functions would be modified or curtailed in an emergency, for example:

(a) Normal menus would be limited and modified to a minimum of nutritionally essential food. Packaged food should be used whenever possible.

(b) Preparation and work in connection with the following items would be discontinued: special diets; pastry and other special desserts; salads; and normal tray set-up.

(c) When facilities are available, food distribution for patients should be decentralized. Bulk food should be delivered to the appropriate units by a serving team under the direction of the dietary department. Where decentralized food distribution is not practical, the dietary department should be prepared to serve meals to patients continuously throughout the day, using available facilities as efficiently as possible.

(d) Personnel food service should preferably be cafeteria type. Regular counters, tables, or benches with stools or chairs should be arranged to increase the seating capacity of the dining area and speed up service.

(e) Staggered meal periods should be instituted for patients and personnel so that both equipment and dietary personnel could handle the increased workload.

(f) Paper dishes should be used wherever possible. The hospital should not depend on additional personnel from another area of the hospital to staff the dietary service, but should utilize volunteer workers.

Concerning facilities in a hospital dietary department to handle emergency demands, the report states:

(a) The existing space and equipment probably would be able to carry the additional load if used on a 24-hr. basis.

(b) Utility services, such as gas, electricity, and refrigeration, might not be furnished to the food service department for at least several hours following the emergency. If necessary, temporary cooking facilities should be provided outside the hospital. These could be very simple, such as open fires with sheet metal plates and large cans. Packaged, precooked foods should be used if possible.

MASS FEEDING

In general, the functions pertaining to mass feeding will be divided between: (a) a special nutrition service, (b) the welfare service, and (c) the sanitation service. The nutrition and sanitary units, operating under the Public Health Services Branch of the Health Service Division, should establish nutritional and sanitary standards to guide the emergency Welfare Service, which is charged with administering and executing the feeding program. The nutrition and sanitary services will be expected to assist the welfare service in maintaining and enforcing standards.

It is thought that emergency feeding might be required for people whose homes had been destroyed, for those who might be temporarily cut off from their homes, for groups waiting evacuation, for evacuees from neighboring areas, and for essential civil defense workers. Emergency feeding would be needed for varying periods from a few days to as long as thirty days in some instances. The need for feeding many families might be limited, since their homes would be intact and they would have on hand two or three days' supply of food; other families whose homes might be temporarily or permanently uninhabitable would be relocated within a few days to areas where they could procure food.

Actual procurement of food, storage, distribution, cooking, and feeding of recommended foods, as well as procurement and use of facilities is to be the responsibility of the welfare service. In the earlier publication, *United States Civil Defense*, the government roughly outlined the general functions of the welfare service in mass feeding as follows:

"Mass feeding, clothing, and shelter may be needed by large numbers of persons in postattack situations. These will be similar to the disaster services provided by the Red Cross in peacetime. For that reason, the Red Cross can assist materially in planning for these services. Information, referral services, and guidance on an individual or family basis should be provided. Each individual and family needs help to move back quickly to independent living.

"Plans must be made for mass feeding of all civilian evacuees from the disaster area at assembly areas, en route, and at reception centers. These plans must also be related to plans for emergency shelter. Wherever possible, food and shelter should be provided at the same facility.

"A survey should be conducted throughout the area of each local civil-defense organization to list all eating establishments, commercial and private, their normal feeding capacity and possible degree of expansion, also all other feeding facilities, including mobile canteens and food trains, available cooking and serving equipment, food supplies (retail, wholesale, and government), also persons experienced in preparing and serving large quantities of food.

"Mass-feeding menus should be secured in advance from the health services. An additional step should be the negotiation of agreements with private food-facility owners for the use of their establishments and for the release of supplies and equipment, when needed, for emergency feeding.

"Inventories of such facilities, equipment, supplies, and personnel, together with copies of negotiated agreements, should be used by local and state civil defense agencies in planning mutual-aid operations.

"Related to mass feeding of the homeless, but calling for a separate organization and separate facilities, is the problem of feeding civil defense workers on the job. Fire fighting, rescue, engineering, and other crews may be engaged for many consecutive hours.

"At the scene of attack it is the responsibility of the welfare service to organize feeding facilities, including mobile facilities. Mobile support units from other localities should be self-sufficient to this end at least for the first two days. After that period any such groups may have to be included in the feeding program."

The program is further elaborated in the recent *Health Services and Special Weapons Defense*, which says: "Many companies in the food preparation and service industries have large staffs with certain types of sanitation experience. Housewives without young children, teachers, and others, especially those with some education in the chemical or biologic sciences, also would be good candidates for training." It is also recommended that "a qualified nutritionist to work with the health service be included on the emergency welfare service staff."

It is evident that planning and anticipating the worst possible conditions is thought to be the only adequate way to prepare for war emergencies.

An estimate of the number of people who might require emergency feeding and the probable duration of an emergency feeding period, should be made by the welfare service and the number of infants, pregnant women, and others requiring special dietary management should also be estimated.

Facilities for preparing and dispensing infants' rations must be considered. From the health standpoint, the emergency welfare service must plan for the following items: (a) a supply of bottles and nipples, and (b) equipment and materials necessary for keeping them free from contamination and for adequate storage of the milk mixtures within the emergency centers. Without provision for these things, the ration might be a means of transmitting disease rather than preserving health. The difficulties associated with proper handling of infants' rations in homes which might be without water or means of heating or refrigeration might be solved most readily by use of communal preparation and distribution

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of milk mixtures adapted to the needs of various ages.

Special proprietary milk preparations of milk substitutes may be included in planning the milk supply for infants depending on the advice of physicians in each locality.

Water is even more essential to infants' survival than food. It is also an essential constituent of milk mixtures. Special provision should be made for an ample supply of safe water for infants.

Although the nutrition service (see below) should be responsible for devising standards for the types and amounts of food to be kept in reserve stocks for emergency use, the welfare service would be responsible for processing and maintaining these stocks. The foods should be nonperishable and should be canned or in waterproof bags. Insofar as possible, they should be (a) of high caloric value per unit of storage space, (b) ready to eat or require a minimum of preparation, (c) require no refrigeration in storage, and (d) be acceptable to the average housewife. Provision should be made for periodic turnover of foods subject to slow deterioration in storage.

### NUTRITION SERVICE

In brief, the duties of the nutrition service, which will function under the Public Health Service Branch of the Health Service Division, are stated as follows: (a) to specify the standards for postdisaster food allocation and to issue certificates of need for special rations; and (b) to plan emergency diets which are consistent with national and state standards.

All segments of the population must, of course, be considered in planning emergency diets and recommending types and amounts of food which should be available. The nutrition service will be expected to plan not only for feeding the general population, but also special groups such as infants, children, pregnant women, the aged, patients with illnesses requiring special diets, and essential civil defense workers.

Hospitals would also need to be advised concerning nutrition plans for (a) patients who might require special emergency feeding when evacuated or moved into temporary hospital accommodations, and (b) aiding in the feeding of large numbers of civilian casualties.

In certain situations, it may be part of the duties of the nutrition service to determine the condition and nutritional needs of the people. Usually this would be needed only after emergency feeding periods of more than thirty days (a) in population groups already subsisting on restricted rations or which have experienced repeated intermittent enemy attacks resulting in continued limitations of food supply, and (b) for individuals having illnesses or injuries which make them unusually vulnerable to the effects of nutritional deficiencies.

Recommendations for remedial action should be made if inadequacies are found.

#### *Recommended Feeding Pattern*

It is recommended that foods for normal healthy people during the first week be planned only to allay hunger and maintain morale; they should be cheap, easily prepared and served, and whenever possible of the kind which fits into the regional food habits. Foods in good supply locally should be given preference, and at least one item on the menu should be served hot for its stimulating and psychological effect.

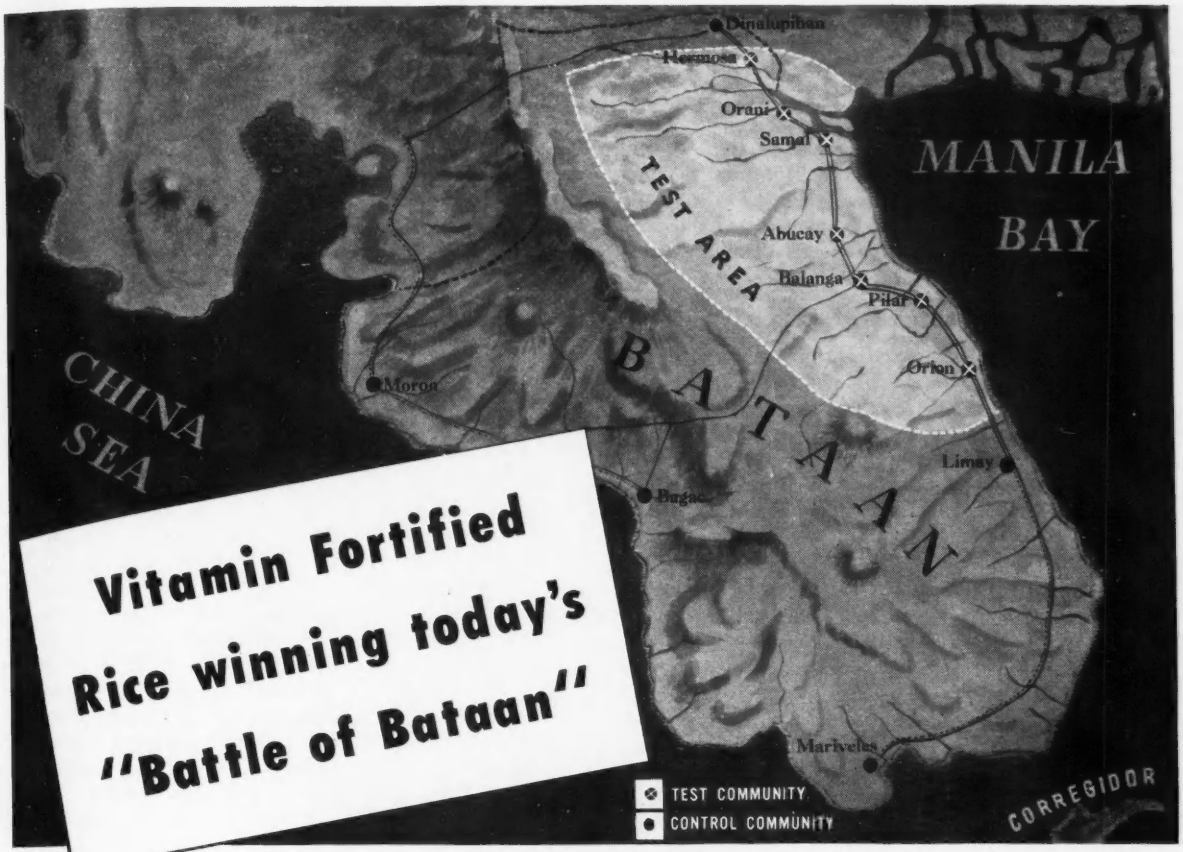
Food should supply 2000 to 2200 calories per capita per day, not including cooking losses and wastage in preparation. Such a food supply, it is felt, would be sufficient to feed a group composed of the normal proportions of infants, children, women, men, pregnant and nursing women. Infants, young children, and sedentary women would require fewer calories than this average, and the saving would permit an extra allowance for women in the latter half of pregnancy, nursing women, and people doing heavy work.

Detailed analysis of the diet to insure adequate intake of each required nutrient would not be necessary, since nutritional deficiencies do not develop if food distribution is equitable and so long as the calories come principally from unrefined or fortified refined foods and not from highly refined foods, such as sugar, lard, and unenriched white flour. However, continuing productive labor could not be expected from people consuming this average. It is felt that the protein could be supplied principally from cereals and vegetables, although if the supply situation permitted, some animal protein should be provided.

Extra allowances of food should be provided and served on the job to civil defense personnel working for extra long periods. These workers should receive as nearly a normal diet as possible, designed to provide at least 3500 calories per day. If they are working in hot environments, they should also receive extra salt in their food, or approximately four 1-gm. salt tablets daily. Essential industries which might require workers to stay on the job over long periods should provide for on-the-job feeding, either with their own facilities or in collaboration with the civil defense organization.

#### *Patients Needing Special Diets*

Special menus for ambulatory diabetic patients, persons suffering from peptic ulcers and related diseases need not be provided immediately following a disaster. It would be impracticable for a number of experienced nutritionists or dietitians to be assigned to procurement of special foods for diabetic persons. Moreover, with few exceptions, it would not be necessary because, temporarily, the disease could be controlled with insulin. The important




# RESULTS OF TREMENDOUS NUTRITIONAL EXPERIMENT USING VITAMIN ENRICHMENT

## ★ Symptoms of 2nd most fatal disease reduced 70%

### ★ Beriberi deaths steadily falling

In an experiment in the Philippines now involving over 90,000 persons, conducted with the approval of the Philippine government and medical associations, and in which Hoffmann-La Roche is proudly cooperating, remarkable health benefits from rice enrichment have been demonstrated. This is reported by Juan Salcedo, Jr., M.D., M.A., Director of Nutrition, Institute of Nutrition, Manila, P.I.

With rice the principal food, and beriberi the No. 2 cause of death, this new "Battle of Bataan" was planned and waged to determine whether enrichment of rice would reduce the incidence of beriberi. Bataan Province was selected because of its high beriberi mortality and because rice traffic could be readily controlled there. (Early investigation showed enriched rice completely satisfactory in taste, color, odor, palatability and digestibility.)

*"There are indications from raw data available from the present clinical beriberi resurvey that the beriberi incidence has been reduced by 70%."**

*Beriberi mortality rates have also steadily dropped in the "enriched rice" area without significant change in the control area.*

### ★ Infantile beriberi virtually eliminated

This dramatic and specific evidence of the benefits of vitamin enrichment should have a vital effect in improving the health of peoples all over the world.

### WHAT THIS MEANS TO YOU

While these facts concern white rice, the conclusion is clear that vitamin and mineral enrichment of white bread, family white flour, macaroni, noodles, and other processed cereals is a direct and practicable way of correcting dietary inadequacies. The Bataan work confirms the judgment of nutritional experts who have advocated such enrichment, and further justifies legislation already enacted in 26 States, Puerto Rico and Hawaii requiring enrichment of all family white flour and white bread.

*Quotation from latest of published interim medical reports. *Write for reprint.*

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measures for diabetic persons at such a time would be a continuing supply of insulin. Control of peptic ulcer and other conditions for which special diets usually are prescribed would also be more readily accomplished by drugs and medicines rather than by diet. However, the needs of persons suffering from such diseases should be recognized and met as soon as an adequate flow of supplies was re-established.

### *Diets for Infants*

Infants have less choice of food that will meet their nutritive needs than older persons. They are dependent on a few highly nutritious foods, the most important of which is milk. Since the normal fluid milk supply would almost certainly be disrupted in the event of a disaster, principal reliance for emergency feeding of infants should be placed on canned evaporated milk, or, for children over two years old, on spray-dried whole milk.

Rations for infants under two years of age should be estimated in terms of (a) food items per infant per day, and (b) total items required for all infants normally present in a population of 100,000. Two sets of rations should be devised: the first, for a period of one week immediately following the disaster (Table 1), and second, for a period of four weeks during which food supplies and distribution are becoming stabilized. If neither rations A or B (Table 1) could be provided, the closest possible approximation in terms of nutritive value should be supplied. In this case, one of the following methods should be used:

TABLE 1

*Estimated food requirements for infants under two years of age*

| FOOD ITEMS | RATION A For use immediately following disaster | | RATION B For period of 1 to 4 weeks following disaster | |
|---|---|---|---|---|
| | Amount per infant per day | Amount per 100,000 population per day | Amount per infant per day | Amount per 100,000 population per day |
| Water | 1 qt. | 1269 gal. | 1 qt. | 1269 gal. |
| Milk, evaporated with added vitamin D | 1 14½-oz. can | 5077 cans | 1 14½-oz. can | 5077 cans |
| Cane sugar | 1 oz. | 317 lb. | 1 oz. | 317 lb. |
| Crackers, soda or Graham | 1 oz. | 317 lb. | — | — |
| Cereal, wheat or rolled oats | 1 oz. | 317 lb. | ½ oz. | 159 lb. |
| Meat, sieved, or meat soup | — | | 1 3½-oz. can | 5077 cans |
| Vegetable, sieved, or fruit | — | | 1 4½-oz. can | 5077 cans |

*Food Supply:* Except for milk, which would have to be provided on a much more liberal per capita basis than for the general population, infants' needs during a brief emergency could be met from the ration for the normal person. However, since facilities for home preparation of food probably would be disrupted, the use of ready-cooked, canned baby foods (especially vegetables, cereals, and meat soup or sieved meat) to supplement milk should be considered. The time ordinarily given to preparation of meals for infants could be used elsewhere advantageously.

*Vitamins:* If evaporated milk fortified with vitamin D were available, no other source of that vitamin would be needed during an emergency lasting not more than a month. Infants' ascorbic acid need could be disregarded during an emergency of not more than a month; however, either a food source, such as citrus fruit juice, or synthetic ascorbic acid should be provided.

*Carbohydrate:* The carbohydrate needs of infants throughout the first year could be met from the general ration. From the beginning, infants should have sugar in their milk mixture. Cane sugar would serve the purpose. The cereal of the older infant should preferably be of the enriched or whole grain variety. Rolled oats, whole wheat cereal, enriched farina, or enriched white bread could be used. Special baby cereals which require only the addition of water have many advantages but are not essential.

*Protein:* For infants of four months and older, the recommended supply of milk would meet most of the protein requirements for a period up to thirty days. Some form of protein foods, such as meats and meat soups prepared especially for babies, or dried eggs or canned meats from the general ration, is desirable and should be provided if the supply permits.

### *Milk Supplies*

Since milk is essential to infants under two years, adequate provisions for emergency supplies of milk must be made. After their needs are completely met, any remaining milk supplies should be allocated in the amounts and in the order of priority shown in Table 2. It is recommended that milk supplies for infants under two be in the form of canned evaporated milk preparations. Milk for the other groups listed in Table 2 may be obtained from spray-dried whole or skim milk, or such safe fluid milk as might be available. Supplies of safe milk should be provided to sick children on a priority identical to that for infants under two. Mothers of breast-fed infants should receive the infant's allocation of milk.

Information will be issued later which will suggest: (a) a list of usually available foods which are stable in storage and suitable for the purposes of emergency feeding after disaster; (b) menus which can be used with these foods to provide the recommended daily

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Imagine color that's "good to eat"—literally! Color that comes from nature itself, color worth its weight in nourishment, color chock-full of vitamin A! That's carotene . . . and *that's* what makes Nucoa yellow. *Yellow* Nucoa is the *only* margarine colored with health-promoting carotene . . . the only margarine that gives you real nutrition even in the color used!

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## Always one step ahead to bring you a better spread!

In those states where the ban on yellow margarine has not yet been lifted, get Nucoa in the handy Measure-Pak.
ONE POUND NET WEIGHT
NUCOA
4 QUARTERS
YELLOW
4 QUARTER POUND YELLOW PRINTS
OLEOMARGARINE
★ It's fresh!
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Money can't buy a more nourishing yellow spread than Nucoa margarine. It's made of only the finest vegetable oils, and every pound is enriched with 15,000 units of vitamin A—all year round. Nucoa is always fresh, because it's "made to order." There's no such thing as storage Nucoa. You'll find it delicious as a spread for bread . . . a topping for vegetables . . . in sauces . . . for all kinds of cooking. For true economy, for the best in flavor—you can't do better than Nucoa!

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TABLE 2

*Recommended milk ration for population in order of priority**

| POPULATION GROUP | NUMBER OF 14½-OZ. CANS OF EVAPORATED MILK | |
|---|---|---|
| | Per person per day | Per 100,005 population per day |
| Infants under 1 year | 1 | 2446 |
| Children 1 to just under 2 years | 1 | 2631 |
| Sick children 2 through 9 years | 1 | 44 |
| Women in last half of pregnancy | 1 | 950 |
| Well children 2 through 9 years | ½ | 7953 |
| Sick persons of 10 years or over | 1 | 591 |
| Well children 10 through 14 years | ½ | 3702 |
| Well children 15 through 19 years | ½ | 3698 |

* Data supplied by Children's Bureau, Federal Security Agency.

2000 to 2200 calories; and (c) the quantity of various foods necessary per 1000 people each day of emergency feeding.

## CONTAMINATION

### *Water*

The minimum requirement of potable water per day per person is 1 gal. All cities have important secondary sources of water which might be used to meet drinking, culinary, and other domestic needs. Such resources include wells used for air-conditioning systems, swimming pools, breweries, milk plants, and other industrial establishments. The capacity and quality of such supplies should be catalogued by the sanitary service and their availability in the absence of public power should be assessed.

All water for domestic use should be disinfected. Hypochlorites (for example, HTH, perchloron, chloride of lime, halazone) or other disinfectants may be used for small quantities of drinking water. Because of the possible difficulty of detecting and correcting contamination after a disaster, the public should be advised to boil all drinking water until notified to the contrary. If there is evidence of biologic contamination through sabotage, the health office should again issue orders to the public to boil all drinking water.

The danger of radiological contamination from a high-air burst of an atom bomb would not be serious, but a surface or underwater burst might produce very heavy contamination of water supplies, for example in open reservoirs. The hazards from this contamination might be serious enough to preclude temporarily the use of water for drinking and cooking, for dressing open wounds, and for industrial uses that might transfer the radioactivity to products that would be eaten, worn, or used by the public. The length of time the water would be unusable would depend on the amount and type of contamination, which in turn would depend on the distance of the water supply from the bomb burst.

The radioactivity of water drawn from contaminated surface supplies may be removed by the usual processes of sedimentation, coagulation, and filtration. One safety factor in the ingestion of radioactive particles is normal radioactivity decay, which quickly reduces the contamination to safe levels. A second factor is the tendency of most fission products to pass through the body quickly, producing little or no damage. However, even at low levels of radioactivity, prolonged and repeated ingestion of contaminated water or food products should not be permitted. *Chlorination and boiling do not remove radioactivity* but distillation, when feasible, is effective in producing radioactive-free water.[1]

### *Milk*

The destruction of pasteurization plants, or the loss of power or water at such plants, would create serious hazards. In such an event, householders should be instructed to boil all market milk for at least 1 min., and market milk served at central feeding places should be boiled under health service supervision. *Under no circumstances should raw milk be used.*

Contamination of milk at bottling plants should not be overlooked as a sabotage possibility. Tremendous numbers of organisms can be concentrated in small containers and can easily be released in a pasteurization vat or filler and capper. Surface contamination of vats and coolers is less likely. Health service officials should warn plant operators of the need for constant vigilance in this regard.

The hazard of radioactive contamination of fluid milk is slight. Fluid milk exposed to war gases, on the other hand, should be disposed of in such a way that it would not be used as food for man or animal and could not contaminate water or other foodstuffs. Burial is the most feasible method.

### *Foods*

Foods might be contaminated from an atomic burst. Radiological specialists must determine whether open or exposed foodstuffs from markets,

[1] A recent announcement from Oak Ridge by the Atomic Energy Commission tells of the development of a simple, inexpensive device to remove radioactive contamination from liquids. The device, developed by A. H. Ammons and Robert A. Launderdale at the Oak Ridge national laboratory, consists of six layers of absorbents through which contaminated liquids pass. Materials in the unit cost about $2.50. According to Dr. K. Z. Morgan, Director of the Health Physics Division of the laboratory, the device will be studied by the Federal Civil Defense Administration for possible defense application.

# MINERALS, VITAMINS AND PROTEINS SUPPLIED BY ANIMAL PRODUCTS

Per Therm (1,000 Calories) of Edible Material

| ANIMAL PRODUCT | Ca | Fe | VIT. A | THIAMINE | RIBOFLAVIN | NIACIN | VIT. D | PROTEIN |
|---|---|---|---|---|---|---|---|---|
| | *mg* | *mg* | *I.U.* | *mg* | *mg* | *mg* | *I.U.* | *gm* |
| Pork | 15 | 4 | 0 | 1.6 | 0.3 | 7.1 | 0 | 26 |
| Milk *(Dairy Cow)* | 1710 | 3 | 2319 | 0.6 | 2.5 | 1.4 | 38 | 51 |
| Eggs | 342 | 17 | 7215 | 0.8 | 2.2 | 0.6 | 600 | 81 |
| Poultry Meat | 83 | 10 | 0 | 0.6 | 0.9 | 44.3 | 0 | 104 |
| Beef | 37 | 10 | 0 | 0.4 | 0.5 | 17.5 | 0 | 65 |
| Lamb | 29 | 8 | 0 | 0.6 | 0.7 | 16.6 | 0 | 50 |

*A zero indicates none or negligible amounts*

MOST everyone likes eggs and poultry meat. Yet not everyone realizes the great nutritional value of these foods they like so well.

In presenting the above data in "The Journal of Nutrition" (1), Dr. L. A. Maynard of Cornell University points out that on an energy basis poultry meat, "supplies more *protein* than other animal products." Likewise, it has "a special value as a source of *niacin*."

Dr. Maynard also calls attention to the valuable contributions eggs make to the *iron* needs of the body, as well as *vitamins A and D*, and *thiamine*.

With reference to eggs, Dr. Maynard comments that "any over-all nutritional rating of animal products is necessarily subject to the limitations that no one is superior to another in all nutrients. It seems clear that milk should be given first place, particularly in view of its special value and suitability in the diet of the young. In fact, only this last consideration justifies ranking above eggs, which actually surpass milk in some of the nutrients under consideration."

*(1) . . . Pgs. 345-360—Vol. 32—No. 4 October 10, 1946.*

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*This seal signifies that all statements herein pertaining to nutrition have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.*

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restaurants, storage, and food processing plants within the zone of residual contamination may be safely used. Any contaminated nonperishable foodstuffs should not be destroyed, unless specialist teams have analyzed them and advised disposal. Cooking does not destroy or remove radioactivity.

Following an atomic burst, foods in undamaged refrigerators, cans, bottles, jars, and sealed packages, whether in homes, markets, restaurants, or storage, could be used without prior monitoring, provided care is exercised in washing off any dust or liquid from the outside of the container or package before opening. It would also be necessary to take precautions to prevent admitting contaminated particles when opening the container or when removing the contents.

Food could also be contaminated through biologic warfare, as discussed above in the section on milk. Large quantities of meat might be subjected to varying degrees of exposure as a result of attack by atomic, chemical, or biologic weapons, and the fighting of such a situation would depend upon a corps of veterinarians. Following the disaster, the veterinary unit of the Public Health Services Branch, would depend on the local monitoring services to ascertain the degree of atomic and/or chemical contamination of meat. Where other foods are concerned, the local veterinary group should collaborate with the food specialists concerned.

Chemical warfare developments may also have a bearing on food supplies—particularly the so-called nerve gases developed in Germany in World War II. These nerve gases are more toxic than any previously known and are nearly colorless and odorless. They are liquids which yield toxic vapors as they evaporate. From what is known regarding their stability, they may dangerously contaminate exposed food of high water or fat content, including milk. Dry foods, such as sugar and flour, are relatively little affected. Foods in air-tight packages are not contaminated by nerve gas vapors, but only those in sealed glass or metal containers are safe from liquid nerve gas. Cooking of foods assists in decomposition of the gas.

In general, large bodies of water, such as reservoirs or lakes, would not be significantly contaminated by exposure to nerve gas vapors. Liquid nerve gas, however, might cause dangerous and persistent contamination of water.

Other potential dangers would be the incidental damage to meat and other foods through exposure to the elements, breakdown of refrigeration, and contamination from broken waste lines and debris of all kinds.

### FOOD SANITATION

Following a disaster, serious problems in food sanitation immediately arise due to: disruption of utilities and/or normal channels of food distribution, the destruction or contamination of food reserves, and the need for mass feeding of large numbers of evacuees. The possibility of food-borne disease outbreaks is increased at a time when normal controls are seriously disrupted. Especially at mass feeding centers, problems would be created because of inadequate equipment and lack of trained food handlers.

Menus should not include items commonly reported to be vehicles of food-borne disease, for example, cream- or custard-filled pastries, warmed-over poultry dressing and gravy, and smoked ham. Thorough cooking is a basic safeguard against food-borne disease or food poisoning. Civil defense health plans should provide for:

(a) Instructors to aid the welfare service in training volunteer or emergency food handlers in safe food practices.

(b) Close inspection by trained sanitation personnel of large mass feeding centers.

(c) Training and assignment of volunteer or emergency food inspectors.

(d) Prompt inspection and supervision of disposal of damaged foodstuffs.

Perishable foodstuffs stored at points remote from areas directly affected by an enemy attack might be damaged because of the failure of refrigeration. Stand-by power for cold storage plants, food storage lockers, and wholesale markets and warehouses should be encouraged.

Civil defense health officials should recognize that foodstuffs would begin to flow into the community shortly after the disaster, and that provision should be made for routine inspection of such shipments. Experience has shown that in time of crisis, extra vigilance may be necessary to exclude substandard shipments of food.

Copies of the two government tracts from which the foregoing data were taken may be obtained from the Government Printing Office, Washington. *Health Services and Special Weapons Defense* is listed as Federal Civil Defense Administration Publication AG-11-1 and costs 60 cents a copy; *United States Civil Defense* is NSRB Doc. No. 128, costing 25 cents.

### *Cholesterol*

Cholesterol is a product of metabolism but not necessarily of fat metabolism and not necessarily a "faulty product." Cholesterol is synthesized by the body from simpler substances which can be derived from fat, protein, or carbohydrate. Cholesterol so formed is referred to as endogenous cholesterol. Exogenous cholesterol is that received as such from dietary sources. Much research on cholesterol metabolism is in progress.—*From Queries and Minor Notes, J.A.M.A. 145: 60 (Jan. 6), 1951.*

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"There's nothing better than Keego* for dishwashing by machine," says one customer. "We like Keego not only for its results, but for its appearance. There is no chance of mistaking it for salt, sugar and other crystalline products."

Yes, Wyandotte Keego *is* safer! Safer to have around. Safer for brass, aluminum and copper. Safer for silverware. Try Keego! It's fine for dishes, glasses, silver and cooking utensils. It removes stain (gradually) from dishes, often eliminates hand toweling. Ask your Wyandotte Representative or Supplier to *show* you why Keego is best for dishwashing by machine.

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# Book Reviews

**Food for Fifty.** By Sina Faye Fowler and Bessie Brooks West. 3rd edition. New York: John Wiley and Son, Inc., 1950. Cloth. Pp. 444. Price $4.50.

This third edition of a well-known book affords valuable information to anyone responsible for quantity food service. It is especially intended to be a helpful guide in menu planning, food purchasing, preparation, and serving. In terms of the authors' own expression, the purpose of the revised edition is essentially the same as that of the original copy published in 1937, namely, "to provide a limited number of carefully tested institutional formulae for use in food services and institutional classes."

The authors have not changed the organization of the material in this edition, but have included new features.

In Part 1, General Information, is offered a noticeable amount of new tabular material. Of particular interest is the data on servings per unit for various canned foods in common can sizes, lists of approximate average weights of various commodities, food uses of spices and seasonings, approximate equivalent substitutions, and a section on frozen foods which includes directions for cooking frozen fruits, vegetables, and meats. Valuable tabular material found in the previous editions is retained.

Part 2 contains a chapter on "Luncheon Dishes" which is a new feature in this edition. Another change in this part is that all recipes for cakes, cookies, puddings, pastries, and so on, have been brought together under the general heading of "Desserts." The chapter on baking includes step-by-step illustrations of various procedures. A good feature which has been retained in this edition is the inclusion of basic recipes with many suggestions for variations. This makes possible variety in menus without complicating work procedures. New items are suggested for use of excess food and for left-overs.

*Food for Fifty* is well adapted for use in teaching quantity cookery, as originally planned by the authors, as well as a reliable source of information for group feeding.—*Mae Whitmer, Chief, Dietetic Service and Dietetic Staff, Veterans Administration Hospital, Springfield, Missouri.*

**A Story of Nutritional Research.** The Effect of Vitamin A and D, and Toxamins on Bones and the Nervous System. By Sir Edward Mellanby. Baltimore: The Williams & Wilkins Co., 1950. Cloth. Pp. 454. Price $5.

This book is composed of the series of Flexner Lectures presented in March, 1947, by Sir Edward Mellanby for the School of Medicine of Vanderbilt University. The two main aspects of research discussed originated from Mellanby's early work on the oxidative processes in the cause of rickets.

Part I is concerned with a discussion of the effect of vitamin A on bone growth and the nervous system. Experiments are presented which show the work involved in trying to solve the problem of ataxia and incoordination of movement which developed in growing animals receiving a diet adequate except for vitamin A and carotene. Experiments which failed to solve the problem as well as those contributing positive results are related as part of the trend of thought leading to the conclusion that vitamin A influenced the shape or molding of growing bones. The nerve degeneration resulting from an absence of vitamin A in the diet was shown to be due to the pressure on the nervous system by the thickened and misshapen bones.

Part II is a report of the "interfering effect of cereals on bone calcifications." The effect was found to be due to the phytate content of cereals. A discussion of the relationship of phytate and vitamin D in the absorption of calcium is presented through reports of experiments which were conducted.

The photomicrographs and radiographs used as illustrations add to the value of this book.

*A Story of Nutritional Research* is written principally from the medical standpoint. However, it will be of interest to all concerned with the development of nutrition knowledge and to workers in the field of nutrition research.—*Bessie L. Davey, Ph.D., Associate Professor, University of Alabama, Tuscaloosa.*

**The Mental Health Programs of the Forty-Eight States.** Chicago: Council of State Governments (1313 East 69th Street), 1950. Paper. Pp. 377. Price $4.

This report of the mental health programs of our states is intended to show some of our needs in this area and what can be done now to meet them. The report was prepared from information gathered from questionnaires sent to the offices of all the state governors and state mental health and hospital authorities.

The questions concerning food and its service included: the types of dining rooms, their location in relation to the kitchen, types of food conveyors and time spent in transporting food from kitchen to dining areas, types of dishes and cutlery used, provision of napkins, patients' choice of foods, who prepares the menus, who supervises the food service, and who supervises patients at meal time. There were several questions about the food itself, including the sources of food, its cost, whether the hospital has a standard food ration showing daily food requirements per patient, how often butter or margarine is served, the per capita allowance of milk, and whether milk is pasteurized, bread is enriched, and frozen foods are provided.

Almost three-fourths (72 per cent) of the 187 hospitals replying to the question reported their menus are prepared by a "qualified dietitian." In the remainder, menus are prepared by a cook, clerk, or other person. The sources of food included production on a hospital farm, government surplus, and purchasing in the regular market. Sixty per cent of the hospitals reporting do part of their own canning.

The raw food cost in 1949 ranged from a low of 8 cents per patient-day to a high of 93 cents. Six states reported one or more hospitals spending 12 cents or less per patient-day. The greater number spent from 40 to 59 cents for raw food. These costs included an estimated fair market value for farm produce and government surpluses, but undoubtedly the estimates differed from state to state.

In the "Summary and Recommendations," this quotable item is included: "Food is a most important therapy. Food—adequate in quantity and nutritional value, properly prepared and attractively served—is even more important in the treatment of mental than in physical illness. Nothing is more conducive to the well-being or ill-being of patients than the manner in which food is provided, prepared, and served. The diets of patients should be professionally planned, and each hospital should have on its staff at least one competent, well-trained dietitian who should be in charge of a well-organized food division."—*Vera W. Walker, Florida State Welfare Board, Jacksonville.*

# *Bananas... a natural sweetener*

● One medium-sized fully ripe banana (yellow peel flecked with brown) contains the equivalent of 4 to 5 level teaspoons natural sugar — as follows:

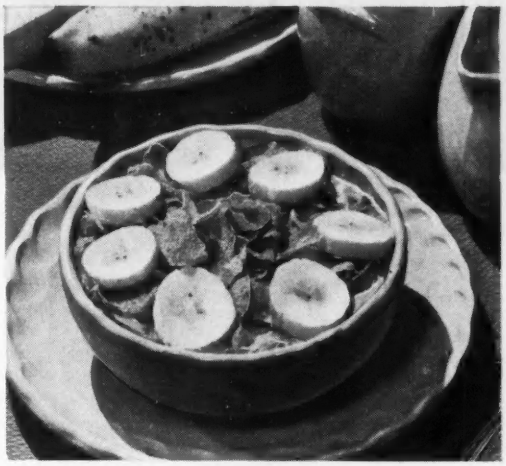
Sugars in the Banana Total 20.4%

4.6% dextrose
3.6% levulose
12.2% sucrose

**VITAMIN CONTENT PER 100 GRAMS**

A..... 250-335 International Units
$B_1$ (Thiamine) ..... 42-54 Micrograms
$B_2$ or G (Riboflavin)..... 88 Micrograms
Niacin (Nicotinic Acid).. 0.6 Milligrams
C (Ascorbic Acid)..... 10-11 Milligrams

Bananas Contain 11 Essential Minerals



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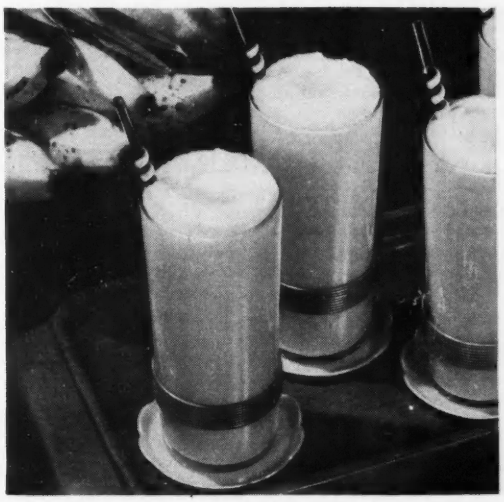

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## Banana Milk Shake

**1 fully ripe banana*** **1 cup (8 ounces) COLD milk**

**Use fully ripe banana... peel well flecked with brown*

Peel banana. Slice into a bowl and beat with electric mixer or rotary egg beater until smooth and creamy. Add milk and mix thoroughly. Serve immediately.

Makes 1 large or 2 medium-sized drinks.

**Banana Milk Shake is only one of many new uses for Bananas**

# Current Literature

*Contributed by Pauline Kegereis, The Children's Mercy Hospital, Kansas City, Missouri; Berdena Rosenow, University of Kansas Medical Center, Kansas City, Kansas; Mildred Bonnell and administrative interns, University of Washington, Seattle; and the Journal Staff*

## AMERICAN JOURNAL OF NURSING

*Vol. 50, November, 1950*

* Streamlining tray service. M. W. Northrop.—p. 727.

**Streamlining Tray Service.** A survey of the entire scope of hospital tray service is presented from the viewpoint of giving the nurse a better understanding of her part in the program.

## THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

*Vol. 144, November 18, 1950*

* Protein metabolism in surgical patients. I. S. Ravdin and N. S. Gimbel.—p. 979.
* Importance of foods in patients as determined by skin testing and intentional feeding. H. Leibowitz, A. Chester, and H. Markow.—p. 990.
* Human cholesterol levels and diet. Editorials and Comments.—p. 1006.

*Vol. 144, November 25, 1950*

* Advances in the management of jaundice. F. Steigmann.—p. 1076.
* Intravenously administered saccharated iron oxide in the treatment of hypochromic anemia. E. B. Brown, C. V. Moore, C. Reynafarje, and D. E. Smith.—p. 1084.
* Origin of the bile pigments. Editorials and Comments.—p. 1098.

*Vol. 144, December 2, 1950*

Clinical physiology of potassium. W. S. Hoffman.—p. 1157.
*Exhaustion in the young business executive. S. A. Portis, I. H. Zitman, and C. H. Lawrence.—p. 1162.
* Cockroach vectors of virus diseases. Editorials and Comments.—p. 1185.

*Vol. 144, December 9, 1950*

Reflections on the causation of diabetes mellitus. R. M. Wilder.—p. 1234.

**Protein Metabolism in Surgical Patients.** Trauma, major surgery, fractures, and extensive burns all contribute to a decidedly negative nitrogen balance, and some investigators believe that another cause for catabolism and antianabolism comes from the adrenal cortical hormones, with the thyroid playing a part. Oral versus intravenous feeding of these patients is discussed. The same number of grams of nitrogen absorbed from the intestinal tract give a slightly greater nitrogen retention than when given by vein.

**Skin Testing for Allergens.** A study was made with seventy allergic patients, using both skin tests and intentional feeding tests. Clinical confirmation of the foods giving positive intradermal skin tests in 35 per cent of the patients indicated that skin testing with foods was a useful diagnostic procedure. Foods played a minor role compared to pollens, inhalants, and bacteria in most of the cases of respiratory allergy.

**Human Blood Cholesterol Levels and Diet.** Recent investigations indicate that if the reduction of the blood cholesterol is to be used as a prophylaxis against atherosclerosis, the ingested cholesterol must approach zero; half-way measures will not do.

**Management of Jaundice.** After having treated over five hundred jaundiced patients, the author presented a therapeutic plan, stressing that not all the procedures were applicable in all patients. Diet must be high in calories, vitamins, carbohydrates, and proteins. The amount of fat to be included in the diet is somewhat controversial, and variations are presented by the author. The average patient should have a low-sodium diet; salts, spices, and other condiments are best avoided. Meals should be small and frequent.

**Parenteral Iron for Hypochromic Anemia.** This paper discusses therapeutic results, potential dangers, and indications for the use of saccharated iron oxide as parenteral therapy to alleviate hypochromic anemia. Of interest to nutritionists is a small reference to an example of excessive deposition of iron in human beings. Cytosiderosis was found in young adults among pellagrous Bantu natives of South Africa whose food consists almost entirely of maize. The large amounts of inorganic iron in the diet apparently comes from cooking utensils, and at least one factor which promotes excessive iron absorption is the low phosphorus content of the maize.

**Origin of the Bile Pigments.** Using the modern isotopic tracer technique, investigators at Columbia University have confirmed that bile pigments are derived from the breakdown of hemoglobin, but they also have found that there is another, unknown precursor yet to be identified.

**Exhaustion in the Young Executive.** Fifty business executives under fifty years of age were compared as to physical conditions, laboratory observations, roentgenologic evidence of abnormality, and emotional status. Fatigue was one of the outstanding complaints. Since fatigue is often related to a disturbance of carbohydrate metabolism and to faulty dietary habits, a dietary and pharmacologic approach to therapy was suggested, along with other therapy. A proper diet was suggested. A sample of meals for one day is given.

**Cockroaches.** Feces from cockroaches innoculated with a suspension of brain tissue from a mouse dying of encephalomyelitis were collected. This fecal material was prepared and innoculated into healthy mice. For each of the first six consecutive days thereafter, this excreta from the cockroaches was found to contain enough virus to paralyze and kill the mice in two to four days. Because of the longevity and nocturnal habits of cockroaches and the intimacy and constancy of their association with the food and excreta of man and animals, this experimental evidence is of suggestive clinical interest.

## JOURNAL OF BIOLOGICAL CHEMISTRY

*Vol. 187, November, 1950*

* The effect of increasing age on serum cholesterol concentration.—W. M. Sperry and M. Webb.—p. 107.

Amino acid composition of hemoglobins of normal Negroes and sickle-cell anemics. W. A. Schroeder, L. M. Kay, and I. C. Wells.—p. 221.

**Age and Serum Cholesterol Concentration.** Some studies have been made which have indicated a considerable increase in the average serum cholesterol concentration of

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| Protein | 12.5 Gm. | 15.8 Gm. |
| Fat | 12.8 Gm. | 8.0 Gm. |
| Carbohydrate | 16.2 Gm. | 25.5 Gm. |
| Calcium | 0.24 Gm. | 0.5 Gm. |
| Phosphorus | 0.27 Gm. | 0.4 Gm. |
| Iron | 1.8 mg. | 4.4 mg. |
| Vitamin A | 842 I.U. | 1,745 I.U. |
| Thiamine HCl | 0.16 mg. | 0.7 mg. |
| Riboflavin | 0.5 mg. | 1.6 mg. |
| Niacin | 0.17 mg. | 6.4 mg. |
| Ascorbic Acid | 4.0 mg. | 26.4 mg. |
| Vitamin D | 4 I.U. | 150 I.U. |
| Calories | 230 | 237 |

*Egg-nog nutritive values from Bowes, A. de P., and Church, C. F.: Food Values of Portions Commonly Used. Philadelphia, 1944; fifth edition.

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healthy men with increasing age. Other studies have indicated that in a healthy person the serum cholesterol concentration is maintained, perhaps throughout life. Because of the apparent discrepancy, further studies were made on individuals who had participated in a study thirteen to fifteen years ago. It was concluded that the serum cholesterol concentration increases with age in some persons, but the increase is not an obligatory concomitant of aging.

## JOURNAL OF HOME ECONOMICS

*Vol. 42, November, 1950*

* Dietary practices and nutritional status of two groups of Virginia school children. M. V. Fletcher and C. Schuck.—p. 732.
* Two supplements improve calcium content of foods. M. M. Looper, M. S. Stephens, and H. B. Burton.—p. 739.

**Nutritional Status of Virginia School Children.** This study was undertaken for two purposes: (a) to obtain information on the food habits and nutritional status of school children in Hanover County, Virginia; and (b) to observe the effectiveness of nutrition education in improving food habits and the nutritional status of children. The results of the study are presented.

**Improving Calcium Content of Foods.** Experiments were carried out to determine the effect of adding powdered skim milk or ground eggshell to plain cake, muffins, asparagus soup, and meat loaf. As a result, the amounts of eggshell and dried skim milk which can be added advantageously to these products are listed. The calcium values of one serving of each of the products are given also.

## NUTRITION REVIEWS

*Vol. 8, November, 1950*

* Toxicity of vitamin $B_{12}$.—p. 324.
Utilization of various forms of vitamin A.—p. 325.
* Antibiotics and comparative nutrition.—p. 331.
Fat absorption in the premature infant.—p. 349.

**Toxicity of Vitamin $B_{12}$.** Although it is generally assumed that vitamin $B_{12}$ is nontoxic even in amounts which might be considered large in view of its potency, there have been indications of a toxic action in mice. An experiment carried out on forty albino mice is described.

**Antibiotics and Comparative Nutrition.** The facts now available on the mode of action of the sulfonamides, penicillin, and streptomycin, and the implications of these facts in the field of comparative nutrition are summarized.

## PUBLIC HEALTH REPORTS

*Vol. 65, September 22, 1950*

Tularemia in man from a domestic rural water supply. W. L. Jellison, D. C Epler, E. Kuhns, and G. M. Kohls.—p. 1219.

*Vol. 65, October 13, 1950*

* Saline solution in treatment of burn shock.—p. 1317.
Detection of diabetes in a nutrition survey. E. C. Tabor and K. H. Frankhauser.—p. 1330.
* Dental caries in morphine addicts. F. E. Law and J. W. Ruble.—p. 1336.

**Saline Solution for Burn Shock.** The Surgery Study Section of the National Institutes of Health has recommended to the Surgeon General of the U. S. Public Health Service that the use of oral saline solution be adopted as standard procedure in the treatment of shock due to burns and other serious injuries in the event of a large scale civilian catastrophe.

The most palatable salt solution is made by dissolving 3 to 4 gm. sodium chloride and 2 to 3 gm. sodium citrate in each liter of water. If sodium citrate is not available, ordinary baking soda may be substituted. The concentration of salt should not be in excess of 140 milliequivalents of sodium per liter. If concentration is above this, vomiting and diarrhea become important complicating factors. The slightly hypotonic salt solution is the only drinking fluid permitted the injured individuals until the edema of the injured parts begins to subside.

**Dental Caries in Morphine Addicts.** A group of 305 males addicted to morphine, hospitalized in the U. S. Public Health Service Hospital at Lexington, Kentucky, were examined to determine dental conditions. The findings indicated that in this group of men, there was no apparent relationship between the length of time the patient had used morphine and the prevalence of dental caries.

## SCIENCE

*Vol. 112, November 24, 1950*

* Term "vitamin P" recommended to be discontinued.—p. 628.

*Vol. 112, December 1, 1950*

Protein and nucleic acid conference. E. R. Blout and P. M. Doty.—p. 639.

**Vitamin P.** The term "vitamin P" was first applied to a substance present in lemon juice. It was said to be effective in reducing the extent of hemorrhages and extending the duration of life in scorbutic guinea pigs. Subsequent studies have failed to substantiate this and other claims. The recommendation of the Federation of American Societies for Experimental Biology to discontinue the use of the term "vitamin P" is reported in full.

## SURGERY, GYNECOLOGY AND OBSTETRICS

*Vol. 91, October, 1950*

The effect of sodium and chloride lack on intestinal motility and their significance in paralytic ileus. D. H. P. Streeten.—p. 421.
* Colostomy—indications, technique, and management. H. M. Wiley and E. D. Sugarbaker.—p. 435.
* Collective review: principles and techniques of protein therapy in surgical patients. J. L. Chassin.—p. 313.

*Vol. 91, November, 1950*

A study of the lipids in postpartum plasma; its use in rheumatoid arthritis. L. W. Granirer.—p. 591.

**Colostomy.** The circumstances and technique of performing a colostomy are described and illustrated. The method of management of the patient is discussed. In regard to diet, this author rarely finds it necessary to prescribe constipating diets as patients quickly learn what foods cause them to have loose stools. In general, raw vegetables and fresh fruits can be expected to cause some trouble.

**Protein Therapy in Surgical Patients.** The literature concerning the nature of protein depletion in surgical patients is reviewed, and the following conclusions are made: (a) Protein repletion should be accomplished prior to operation whenever possible. (b) Within broad limits, the higher the protein intake (3 to 4 gm. per kilogram), the greater is the quantity of new tissue protein produced. (c) The oral route allows more efficient protein utilization than does the parenteral route. Concentrated protein supplements are recommended. Dried skim milk powder, containing 35 per cent whole protein (casein and lactalbumin) of high biologic value and costing only about 35 cents per pound, is perhaps the most deservedly popular. Baby foods, such as homogenized meats, are often a valuable adjunct. (d) Anemia should be promptly corrected by means of whole blood transfusions. (e) Sufficient carbohydrate or fat must be supplied to prevent the catabolization of protein for the satisfaction of the energy requirements. (f) Good nitrogen retention in average-sized adults can be achieved by using the intravenous route exclusively only if a minimum of 150 gm. protein hydrolysate and 300 gm. glucose are given each day. (g) Successful protein therapy demands individual inprovisation so that each patient receives the combination of agents which results in the greatest dosage and the least psychic and physiologic disturbance.

in her kitchen...

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*Be Sure! For a few cents more you can use the quality she prefers.*

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## AMERICAN RESTAURANT MAGAZINE

*Vol. 34, November, 1950*

* Germ warfare—a training program for food handlers beats this menace H. Farrell.—p. 40.
* Errors in cookery are costly but they can be avoided. J. A. Cline.—p. 43.
* What's a good advertisement? D. Valentine.—p. 70.
Tempting dishes from leftover bread. R. R. Clarke.—p. 118.

**Restaurant Sanitation.** Seven years ago a municipal training program was initiated for all restaurant workers in San Jose, California. The successful program is described in a booklet which has been published by the health department. This article explains how the plan works. Emphasis is placed on the fact that the "food handler classes" are put on in the form of a show—a three-ring circus; experience has proved that the trainees learn more and retain more from this approach. The classes are given the year around, on a four-week cycle.

**Errors in Cookery.** The two most important ways to prevent errors in cookery are (a) more and better training of cooks, and (b) the use of standardized recipes. In the article, ways to overcome cooking errors are discussed. Detailed tables are also included listing undesirable results in cooked products, pointing out the errors involved, and suggesting how mistakes can be avoided.

**Successful Advertising.** Specific procedures are presented by which restaurant advertisements can be made successful. Ten points are listed which can be used as a check list.

## COLLEGE AND UNIVERSITY BUSINESS

*Vol. 9, November, 1950*

* Student labor program at Drexel is laboratory for community living. L. F. Hack.—p. 44.
* The business manager looks at food services. H. B. Bentsen.—p. 46.

**Student Labor Program.** The problem discussed here involves techniques that can be used by dietitians and food service directors to make the work experience of student employees in a college situation mean more to everyone concerned. The program at Drexel Institute of Technology, Philadelphia, is used as an example.

**Successful Food Service Director.** The qualifications for becoming a successful food service director in a college situation are listed. Technical training and additional requirements are presented. Also outlined are the conditions which the food director has a right to expect from the administrator.

## FOOD INDUSTRIES

*Vol. 22, November, 1950*

* WRRL "puffs" potatoes. W. O. Harrington and F. P. Griffiths.—p. 45.
Advances in evaporation, freezing made by Minute Maid plant. H. R. Cloud.—p. 64.
* Just like human milk.—p. 120.

**Potato Puffs.** A new oil-free, pillow-shaped, puffed potato tidbit has been developed at the Western Regional Research Laboratory of the U. S. Department of Agriculture. This article includes photographs and tells how the product is manufactured. The puffs have a crunchy texture and a toasted color, and can be flavored.

**Just Like Human Milk.** A new powdered infant food has been produced which compares favorably with breast milk. The synthetic milk is patterned after human milk, with standardized amounts of vitamins A and D, thiamine, riboflavin, niacin, and ascorbic acid included.

## HOSPITALS

*Vol. 24, December, 1950*

* Special-diet dining room serves outpatients and employees. G. R. Wren.—p. 103.

**Special-Diet Dining Room.** Methodist Hospital in Indianapolis has been serving the community for a number of years through a unique feature of its dietary service—a special-diet outpatient dining room. The purposes of the dining room are: (a) to provide meals for individuals in the community who must have special diets every meal for a long period of time and who eat away from home regularly, and (b) to provide a single meal for diabetic patients on the day they visit their doctor at the hospital. The set-up of the dining room is described.

## INSTITUTIONS MAGAZINE

*Vol. 27, November, 1950*

* Investigate lighting practices for kitchens, dining areas.—p. 1.
* Any questions on chinaware? Here's fact-file on ceramics.—p. 4.
What to do when they gripe; lend a sympathetic ear.—p. 78.
* Sanitation termed key to successful hollandaise sauce.—p. 117.
* "And they serve wonderful coffee."—p. 153.

**Lighting for Kitchens, Dining Areas.** A task committee of leading illuminating engineers has been appointed by the Illuminating Engineering Society Council to determine a standard practice of lighting for food service preparation and dining areas. The proposed work of the committee is described.

**Fact-File on Ceramics.** Selection of ceramic tableware involves such considerations as function, quality, design, appropriateness, and harmony with room or table decor. Information on these elements, along with background data on ceramic ware, has been assembled in this article to be used as a fact-file for the food service executive.

**Hollandaise Sauce.** The New York City Department of Health has outlined the proper and safe method for preparing and handling hollandaise sauce, since it has always presented culinary and sanitary problems in mass feeding. The rules to be observed are listed.

**Coffee Brewing.** This is the first in a four-part series on successful coffee brewing. The urn-bag method of coffee brewing is considered in this installment.

## MODERN HOSPITAL

*Vol. 75, November, 1950*

* Current advances in food processing. P. Brockbank and M. Dresslar.—p. 112.
What makes a modern kitchen. A. Beresniakoff.—p. 118.

*Vol. 75, December, 1950*

Music with their meals makes patients happy.—p. 77.
A dietitian defines the objectives of a public relations program. E. A. Mosso.—p. 104.

**Food Processing, Packaging, Preparation, and Storage.** A review is given here of current advances in food preparation methods. Uses of electronic cooking are described; new findings in the use of antioxidants as related to food preserved by freezing and cold storage are presented; data are included on the relations of cooking methods of meat to vitamin retention; and the influences of storage conditions on fruits, vegetables, and eggs are considered. New findings on such topics as candy, bread, and meringues are summarized also.

## PERSONNEL JOURNAL

*Vol. 29, November, 1950*

* Suggestion systems can reduce turnover. J. R. Clarke.—p. 207.
Understanding group thinking in business. D. A. Laird.—p. 211.

**Suggestion Systems and Turnover.** In presenting the causes of labor turnover, the author points out how a suggestion system can be a successful personnel tool. Petty dissatisfactions can thus be spotted as they develop and be corrected before they become more important than the job. Examples of how the suggestion system has worked are included.

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# DANDY OYSTER CRACKERS

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All the good, tasty flavor of these salt-sprinkled soup and oyster crackers is sealed right in the new moistureproof envelope.

## *Reduce waste . . .*

No danger of the crackers becoming limp and soggy—less chance for breakage, too. The right-sized portion for average soup servings.

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The new cellophane package retains the oven-baked crispness which makes Dandy Oyster Crackers so tempting and delicious.

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# News Notes

**Consultants to Armed Services.** Mable MacLachlan, A.D.A. Educational Director, has been appointed to serve as consultant to the Surgeon General of the Army in an advisory capacity to the Dietitian Section of the Women's Medical Specialist Corps.

Daisy I. Purdy, Ph.D., Head of the Household Science Department, Oklahoma A. & M. College, Stillwater, has been appointed dietetic consultant to the U. S. Air Force Surgeon General.

**Conference on Chronic Disease.** March 12 to 14 are the dates for the "Conference on Chronic Disease: Preventive Aspects" which will be sponsored by the Commission on Chronic Illness in cooperation with the National Health Council and the U. S. Public Health Service. Some twenty national organizations have been invited to participate in the conference, which will be held in Chicago. According to the stated objectives, it will consider: (a) primary prevention, that is, the prevention of the occurrence of chronic disease, and (b) secondary prevention, that is preventing progress of disease to more severe stages by detection, diagnosis, and treatment in the symptom-free stages. Consideration will be given to fourteen diseases.

**Dietetic Institutes.** The American Hospital Association has scheduled a two-day institute on dietetics to be conducted in Boston at the Hotel Kenmore on March 29 and 30. It will be held following the New England Hospital Assembly.

From April 23 to 27, the American Hospital Association will sponsor another "Institute on Dietary Department Management" for western administrators and dietitians in Pasadena, California. This is the week preceding the convention of the Association of Western Hospitals in Los Angeles. Plans are being made to include the following topics in the material presented at the institute:

Departmental organization and management, including governing policies and procedures, and departmental and interdepartmental conferences.

Techniques for improving food standards and counteracting high food costs through improving methods, planning layouts and equipment to reduce work, preparation of quality food, food merchandising and styling, pre-costing of menus, good purchasing procedures, food cost control, and eliminating hidden operating costs.

Contribution of the dietary department to hospitals' part in civil defense.

Some sessions will also be devoted to increasing personnel satisfaction and efficiency through better human relations and through identifying and satisfying the training needs of individual employees. Workshops are planned for group discussions related to an analysis of the dietitian's job, use of sub-professional assistants, and the development of programs for training of good supervisory and other personnel.

Further information about either of these institutes may be obtained from Margaret Gillam, Dietary Specialist, American Hospital Association, 18 East Division Street, Chicago 10.

**Former Executive Secretary in New Position.** As of January 1, Gladys E. Hall, formerly Executive Secretary of The American Dietetic Association, joined the staff of Florida State University, Tallahassee, in the capacity of Associate Professor in the Department of Hotel and Restaurant Management.

**New Director for Food and Container Institute.** Announcement has been made of the appointment of Dr. Donald K. Tressler as Scientific Director of the Quartermaster Food and Container Institute, Chicago. Dr. Tressler is well known for his work in the field of frozen foods, having published *The Freezing Preservation of Foods, Into the Freezer—And Out*, and other books and papers on the subject. He was formerly connected with a firm of food consultants.

**Air Force News.** The following dietitians have recently received appointments as second lieutenants in the Women's Medical Specialist Corps of the U. S. Air Force:

Doris Jean Krikac
Mary Elizabeth Murphy
Emily Louise Wheeler

**Honor to Discoverer of Pantothenic Acid.** In December, at the Southwest Regional Meeting of the American Chemical Society in San Antonio, Roger J. Williams, Director of the Biochemical Institute, University of Texas, was honored as this year's winner of the Southwest Award of the American Chemical Society. Dr. Williams is well known as the discoverer of pantothenic acid and as the first person to prepare a concentrate of folic acid.

**New Food Handler Charts.** A series of sixty-six illustrated teaching charts for use in training food handlers has recently been released by Health Publications Institute, Inc., 216 North Dawson Street, Raleigh, North Carolina. The charts, which were developed by the New York State Health Department, can also be used in instructing school and college classes in public health, sanitation, home economics, and institution management. Prices may be obtained by writing to Health Publications Institute.

**Kit for Teaching Diabetics.** A kit of audio-visual aids for use in teaching diabetic patients about their disease and its control is available from Health Publications Institute, Inc. It includes 11 booklets for distribution to patients, a meal planning booklet, sample meal plans arranged for 6 different caloric levels, 11 records, 12 wall charts, an instructor's guide, and a diet card for use by physicians in calculating patients' meal plans, plus a fiberboard carrying case. The entire kit was prepared by the Diabetes Branch, U. S. Public Health Service, in cooperation with The American Dietetic Association and the American Diabetes Association. The information on planning diets is based on the exchange lists reported in the August 1950 issue of the JOURNAL. The entire kit is available for $49.80, and individual items may also be purchased separately. A complete price list and a folder describing the various units included in the kit may be obtained from Health Publications Institute, Inc., 216 North Dawson Street, Raleigh, North Carolina.

**Occupational Publication.** The Women's Bureau, U. S. Department of Labor, has recently released a new publication titled *Women in Higher-Level Positions*. In it is included an analysis of the types of positions held by women who have risen above the ranks of subordinates, as well as discussions of attitudes both of management and of women, training, and factors favoring and deterring advancement. The booklet is available as Women's Bureau No. 236 from the Government Printing Office, Washington 25, for a cost of 25 cents.

**Plentiful Foods.** The Department of Agriculture expects the following foods to be plentiful during February:

*Fruits and vegetables*

| | |
|---|---|
| Apples | Oranges |
| Grapefruit (fresh and processed) | (fresh and processed) |
| Onions | Potatoes |
| | Sauerkraut |

*Protein foods*

| | |
|---|---|
| Chickens—broilers and fryers | Fish—frozen fillets |
| Cottage cheese | Peanut butter |
| Eggs | Shrimp—fresh frozen |
| | Turkeys (heavy) |

*Other*

Honey

**Publication on Milk.** The National Sanitation Foundation, Ann Arbor, Michigan, has released a new publica-

# HEINZ BULK SOUPS

*– Actually Thriftier Than Making Your Own*

Check These 4 Great Advantages!

Makes 20 five-ounce or 14 seven-ounce servings

**Economy**

● **Accurate year-round cost-control forever eliminates the waste that often results when making your own soups.**

**Convenience**

● **You save costly, time-wasting labor! Simply add an equal amount of milk or water, heat and serve. It's quick—it's easy!**

**Quality**

● **The unvarying goodness of their home-tasting flavors make Heinz Soups big favorites that appeal to everyone.**

**Variety**

● **A stock of Heinz 14 Soups enables you to vary your menu and to serve several varieties despite limited kitchen space.**

● You'll find Heinz Condensed Soups in 51-oz. tins as helpful and economical for you as they are for the thousands who have already streamlined their soup service this modern way. Wherever soups are served in quantity—in schools, hospitals, sanitariums and other institutions—Heinz Condensed Soups in 51-oz. tins combine cost-cutting economy and labor-saving convenience with Heinz traditionally fine quality. Unlike ordinary soups, Heinz Soups always have the *same* delicious flavor.

● **Ask Your Heinz Man** to show you the many other important advantages in standardizing on Heinz Soups.

**The "Favorite Heinz 14" in 51-Oz. Tins**

Cream of Tomato • Bean • Split Pea
Genuine Turtle • Cream of Green Pea
Vegetable without Meat • Vegetable
Beef Noodle • Beef With Vegetable
Chicken Noodle • Chicken With Rice
Clam Chowder • Cream of Mushroom
Cream of Chicken

# HEINZ 57 SOUPS

**THESE TWO TESTS PROVE**

***More Coffee Flavor***

**The moment you open a bag of Continental Coffee you catch its roaster-fresh aroma. It's the *extra* flavor that you smell! And that "More Coffee Flavor" is confirmed when you *taste* Continental. The *extra* fragrance, the *extra* flavor prove to you—as they prove to staff and patients—that Continental's "More Coffee Flavor" provides a richer—more delicious cup of coffee. Today and everyday more than 18,000 different hospitals, institutions, restaurants and hotels, serve millions of cups of Continental Coffee—made more inviting and satisfying through Continental's "More Coffee Flavor". Test Continental yourself, you too will discover the greater appeal of Continental's fragrance—it's far more satisfying flavor.**

***Continental Coffee***

**AMERICA'S LEADING COFFEE for RESTAURANTS, HOTELS AND INSTITUTIONS**

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tion, *Quality Milk—A Symbol of Democracy*, as its Bulletin 1-E. In it are explained in readable terms the importance of milk in the diet. The production of milk is traced from the cow through the pasteurization plant to delivery to the home. Various tests of milk and milk products by health departments are also described, and forms used in reporting results of such tests are illustrated. The booklet may be obtained for 25 cents from the Foundation.

**Department of Agriculture Publications.** The Production and Marketing Administration has recently put out a revised edition of *Normal Seasonal Availability of Fresh Fruit and Vegetable Supplies*, which is available to dietitians. Information is presented in chart form and is arranged by regions and periods of greatest supply. Ninety-three commodities are listed for the following regions: Western, Intermountain-Western Plains, North Central, Northeast, Southwest, and Southern. Information is also given as to whether commodities in good supply are likely to be home-grown or shipped-in products. Specific data on current crop or market conditions may be obtained from crop reports issued by the Bureau of Agricultural Economics, or by checking with local offices of PMA's Fresh Fruit and Vegetable Market News Service, addresses of which are given in the publication.

The Bureau of Human Nutrition and Home Economics has released another in its series of school lunch publications. *School Lunch Recipes Using Turkey* is numbered PA-18. Recipes for 100 servings were developed and tested by managers and cooks in several school lunch programs. Much of the information is in chart form, and the content covers helpful items on protection against spoilage and food poisoning, storing and thawing of frozen turkey, the amount to cook, ways it may be served, and recipes for accompanying dressings, sauces, soups, and chowders.

The Interagency Committee on Nutrition Education and School Lunch has compiled *A Selected List of Nutrition and School Lunch Materials*. This list includes non-technical materials prepared by some nine governmental agencies and the American Red Cross. The list points up available pamphlets on general nutrition, foods for growing children and the family, food preparation and preservation, school lunches, and food buying guides. This compilation was issued by the Bureau of Human Nutrition and Home Economics, and is available on request.

The Bureau of Human Nutrition and Home Economics has also issued Part II of its new series on *Recipes for Quantity Service*. Included are recipes in quantities of 25, 50, and 100 portions for turkey sandwich, Spanish pork cutlet, potato-cheese surprise, molded cottage cheese salad, mayonnaise, cooked salad dressing, sweet French dressing, peach cake, peach meringue cake, and orange-cranberry pie. The pamphlet is listed as PA-135.

Consistently Good

For a happy ending to a meal, serve Sexton desserts often . . . shimmering gelatine dessert in six flavors . . . velvety smooth puddings. In all weather and in all ways they are always dependable, keeping their consistency, attractiveness and flavor. Pleasing to the eye and easy on the digestion, they are also easy on your food budget. A trial will prove their popularity and profit.

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DIETETIC SCALE
The standard diet scale of the medical profession for controlled diets. Rotating dial eliminates computation as each item of food is added on the serving plate.
Capacity 500 grams by grams. Stainless steel platform, white enamel body, easy to keep clean.
Model 1411 (illustrated) has glass protected dial, price $15.00
Model 1440 enamel dial, price $10.00
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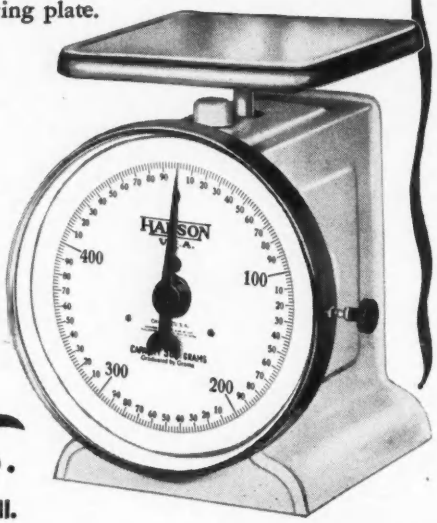

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*Tasty, refreshing fruit juices from sun-ripened fruits.*

FOR THE DIABETIC
*Unsweetened Fruit Juices*
Packed just as they are pressed from sun ripened fruit. Whole fruit juice—no sugar or water added. A good way to add flavorsome variety to diets. Apricot, Grape, Grapefruit, Orange, Pineapple, and many other popular fruit juices available. Exact food values printed on the label to aid diet calculation.
FREE CATALOG
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**Dorothy Shedd Ranney.** The A.D.A. office has received word of the death of Dorothy Shedd Ranney, formerly Therapeutic Dietitian at New England Deaconess Hospital, Boston.

**Harriet Bosma Hammer.** From Albion, Michigan, Dr. M. G. Hammer has written to the A.D.A. office telling of the death of his wife, Harriet, November 30, 1950. Mrs. Hammer has been an A.D.A. member since 1940. Prior to her marriage she had been employed at the Winchester Memorial Hospital, Winchester, Virginia, and at the Union Cafeteria, Michigan State College, East Lansing.

**Summer Course in Food Technology.** Massachusetts Institute of Technology, Cambridge, has announced a summer course in food technology to be given June 25 to July 13. The course will include work in flavor and food acceptance; food bacteriology, sanitation, and fermentations; food chemistry and nutrition, including the use of "tracer" elements; food cost accounting; and sterilization of food by electronics. Field trips will be conducted to thirteen types of food processing plants.

**Food Service in Army Hospitals.** A broad new program for the improvement of hospital administration through the application of the principles and mechanisms of "scientific management" has been inaugurated by the Surgeon General of the Army and put to a six-month test at Valley Forge Army Hospital, Phoenixville, Pennsylvania. The most significant results of this test included: (a) a streamlined organizational pattern designed for standardized application in Army general hospitals, and (b) the use of business machines to provide administrative short cuts.

Of particular interest to dietitians will be the establishment of the Food Service Division. The non-professional operating functions of the hospital were divided into six major organizational elements, of which the Food Service Division was one. It was described in the November 1950 issue of *Hospital Management* as follows: "The food service division is responsible for feeding patients and personnel of the hospital. This includes the procurement and storage of food items, the planning of menus, and the preparation and serving of food. The food service division is divided into a food supply branch, a meat processing branch, a pastry branch, a production and service branch, and a ward food service branch. Under the new organization, the chief of the food service division is a dietitian of the Women's Medical Specialist Corps.

"Under the old organization the food service functions were divided between the mess administrator and the food service supervisor, in what proved to be a vain attempt to relieve dietitians of responsibility for the administrative operation of the food service department while making them answerable for the quality of service provided thereby."

**Nutrition Education in Venezuela.** A recent news story tells of the nutrition

. . . the result of years of research

# DIETETIC TUNA

☆ **Packed by a Special Procedure from selected light meat tuna for use in diet therapy.**

☆ **A "Special purpose food," low in sodium, fat, and cholesterol. Rich in easily digestible protein of high biological value.**

Due to its low sodium content, DIETETIC TUNA is suitable for use in the compounding of low sodium diets for the dietetic management of hypertension, or other cardiorenal diseases.

Its low cholesterol and fat content make it an excellent source of protein in the dietary treatment of such conditions as diseases of the liver, arteriosclerosis and some other vascular diseases.

DIETETIC TUNA is a very valuable adjunct to restricted diets for Weight Reduction and in pregnancy. It supplies a well-proportioned source of all the necessary amino acids without increasing the fat and carbohydrate content of the diets.

Because of its high protein content, its use is recommended also in feeding of the aged, in anemias, and in physical rehabilitation.

The chemical composition and the nutritive properties of DIETETIC TUNA are under constant laboratory supervision.

**TYPICAL** average composition of drained contents

| | |
|---|---|
| Total solids | 30.6% |
| Protein | 28.3% |
| Fat | 0.75% |
| Cholesterol | .07% |
| Sodium | 70 mg.% |
| Iodine | 17 mcg.% |
| Fluorine | 20 ppm |
| Riboflavin | 116 mcg.% |
| Niacin | 13.7 mg.% |
| Animal Protein Factor ($B_{12}$) | 12 mcg.% |

(122 calories per 100 grams)

**WELL PROPORTIONED** combination of all essential amino acids

(Values given as percent of protein)

| | |
|---|---|
| Arginine | 5.2 |
| Histidine | 5.7 |
| Isoleucine | 4.7 |
| Leucine | 7.0 |
| Lysine | 8.3 |
| Methionine | 2.8 |
| Phenylalanine | 3.5 |
| Threonine | 4.1 |
| Tryptophan | 1.1 |
| Valine | 5.2 |

## VAN CAMP LABORATORIES

Division of Van Camp Sea Food Co., Inc.
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ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

*A request on professional stationery will bring samples and bulletins.*

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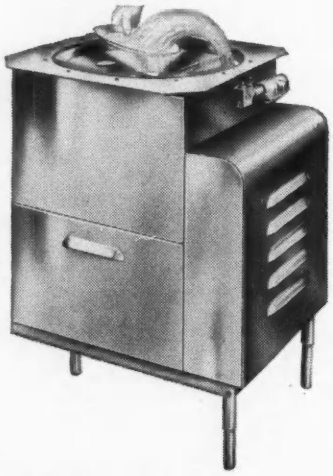
SANITATION
for DIET KITCHENS

*The Popular Salvajor*

The only unit which in one operation scraps and pre-washes dishes; prevents loss of small tableware in garbage and collects food scraps for easy sanitary disposal. Salvajor "Junior" Model ideally fits into diet kitchens. Ask about it.



*The Salvajector*

Performs identically the same functions as the Salvajor machine, except food scraps are shear cut and disposed through the drain as flowing liquid. Fits any standard scrapping table.

THE SALVAJOR COMPANY
118 Southwest Blvd. Kansas City 8, Mo.
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Please send information on (2) Salvajor Scrapping & Pre-Wash Machine (2) Salvajector.

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education program being conducted in Venezuela. Three moving pictures showing Venezuelans how to eat have been prepared by the Inter-American Council of Food Education (which operates under the American International Association of Nelson Rockefeller), the Venezuelan government's National Institute of Nutrition, and the Council of Rural Welfare. The movies, prepared in Venezuela, present the elements of nutrition in simple, understandable form and give cooking, budgeting, and buying hints. The use of motion pictures is the latest step in the Inter-American Council's program, which is already utilizing nine mobile units for instructing people in the interior. These units penetrate to almost every market place in the nation, and with their loudspeakers, their practice kitchens, and their demonstrations teach the people about food and kitchens. Supplementing the demonstrations are records, posters, and pamphlets. Some 50,000 people are reached each month through these units. Radio programs over both government and commercial stations reach some 500,000 people, and newspapers and magazines supply additional information to 200,000. This program, which is financed jointly by the American International Association and the Venezuelan National Institute of Nutrition is considered to be the first and only cooperative information program of its kind in the world.

**Diabetic Camps in Australia.** The September 1950 issue of the *Journal of the Dietetic Association, Victoria* carries an article on the annual diabetic camps which have been held in Australia since 1945. Different camp sites have been used each year, but an attempt is now being made to obtain permanent accommodations. The number of campers has varied from ten in 1945, the first year, to twenty-four in 1949, and ages have ranged from five to twenty years. The camping program has included the usual activities, such as swimming, a fancy dress party, ping pong, and picnics.

**Home Canning in U. S.** A survey shows that 44 per cent of city families do some home canning, despite the availability of canned products in stores. The figure included families who can only a few jars, as well as those who preserve a great deal of food. Even in cities of a million or more population, 20 per cent of the families do some preserving, although home canning is more popular in smaller communities. In cities of 50,000 to 250,000, canning is done in half of the homes, and in towns of 2,500 to 10,000, the figure is 60 per cent.

Income seems to have little influence on home canning, for the same proportion of families with incomes under $1,000 do home preserving as families with incomes of $4,000 to $7,500 or over. No regional pattern of differences was found, either, although individual cities varied from each other. Three-fourths of the families in Minneapolis-St. Paul canned vegetables and fruits in one year, but only 40 per cent in Birmingham, and 30 per cent in San Francisco.

The average canning output was 85 qt., according to this survey conducted by the Bureau of Human Nutrition and Home Economics, U.S.D.A. Of the canned food, 50 per cent was vegetables; 40 per cent, fruit; and 10 per cent, jellies, jams, and preserves. Tomatoes, representing half of all vegetables canned, were the most popular vegetable.

**Ascorbic Acid in Tomato Paste.** A recent study reported by the California Experiment Station indicates that there is a rapid loss of ascorbic acid in tomato paste stored at room temperature. The study was made because products with reduced water content can ease shipping and storage space as well as containers and labor—important considerations in an emergency period when transportation is tight. If more canned tomato pastes or other canned concentrated tomato products could be used, it would be possible to save shipping water. However, after six months' storage at room temperature, the loss of ascorbic acid in three brands of commercially canned tomato paste averaged more than three times the loss in solid-pack canned tomatoes or in canned tomato juice. After a year's storage, two brands had lost 70 per cent of their ascorbic acid. Methods of processing which will help to preserve ascorbic acid in these canned concentrates may be developed after further research.

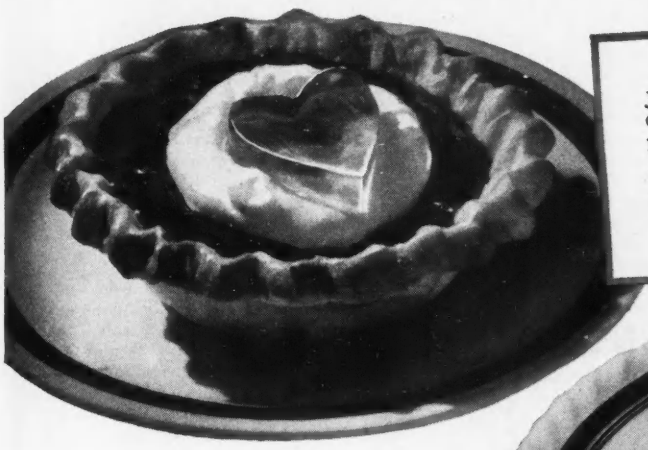
**Soaking Beans.** Specialists in the Bureau of Human Nutrition and Home Economics, U.S.D.A., report that short soaking speeds preparation of dry beans. They suggest: sort and wash beans; then boil 2 cups of dry beans 2 min. in 6 cups of water. Remove from heat and soak 1 hr. Then cook beans in the water they were soaked in, for it now contains the vitamins, minerals, and good bean flavor. Food specialists found Navy, pinto, great northern, red kidney, and large Limas tasted as good or better when quickly soaked as when soaked overnight according to the customary procedure.

**Candy for Military Rations.** At the Southern Regional Research Laboratory, research on candy for use in military rations has been conducted with the aid of the Quartermaster Corps and the National Confectioners' Association. Special emphasis has been put on candies and confections which contain inexpensive agricultural products high in protein or fat.

Excellent caramel bars have been developed from recipes which include dry whole milk whey, which is high in lactose, offers protein, and is a by-product of cheese manufacture. Chemists have also made caramels containing condensed milk and oat flour, as well as corn sirup, sugar, and vegetable fat. Other candies with protein components which have been developed include: nougat and coconut cream candy containing soy protein, and chocolate fudge containing dried brewer's yeast.

Keeping qualities of these candies have also been studied, especially the prevention of rancidity. In candy made

# Three delicious examples of the JELL-O way to cut food costs!



## MINCEMEAT TARTS

Just add 1½ qts. mincemeat to slightly thickened Cherry Jell-O (use 1 lb. Jell-O dissolved in 2¾ qts. hot water). Fill tart shells. Chill them until firm, garnish with whipped cream and a red Jell-O cut-out, and you're all set to charm 48 customers. A spicy-sweet treat at a cost of only . . .

**3¢ A SERVING!**

## LEMON BUTTERFLY CAKES

As dainty as they are delicious! Cut circles of crust from cupcakes, hollow out cake centers, and fill with cooled Jell-O Lemon Pie Filling. Cut circles in half, press into top with rounded edges together. Dust these "wings" with confectioners' sugar for a finish. Easy to fix, and at a cost of less than . . .

**3½¢ A SERVING!**

**These are only three** of the hundreds of quality Jell-O desserts which you can serve for as little as 1½ to 5¢ a serving!

And when you realize that desserts alone account for up to 20% of your total food costs, and that many desserts cost two or three times as much as Jell-O desserts, you'll see how easy it is to save money the Jell-O way.

The Jell-O name assures you of customer acceptance. Jell-O products have been family favorites for over 50 years! Jell-O is the brand your customers know and like best.

So start cutting *your* food costs with desserts made with genuine Jell-O flavored gelatin, and Jell-O Puddings and Pie Fillings. You'll find that any slight difference in initial cost is more than outweighed by your gain in quality . . . volume . . . and customer acceptance.

**FREE OFFER!** Write in or ask your General Foods representative for the wonderful new "GF Album of Desserts." This 24-page illustrated booklet gives directions for preparing 68 different desserts made with Jell-O products, and includes the cost per serving of each. You'll find it an invaluable asset in bolstering your menu with a wide variety of delicious *quality* desserts.

Write to General Foods Corporation, Institution Food Service, 250 Park Avenue, New York 17, N. Y.

## GINGERSNAP FRUIT PUDDING

This beautiful dessert tastes even better than it looks! Simply fold 1 pt. each drained pineapple wedges and sliced bananas into 1 gal. Jell-O Vanilla Pudding. Top servings with crumbled gingersnaps and add fruit garnish. Chill and serve to your delighted customers. All this at a cost of only . . .

**4¢ A SERVING!**

**Products of General Foods**

JELL-O is a registered trade-mark of General Foods Corporation

# JELL-O, JELL-O PUDDINGS and PIE FILLINGS

with butter it has been found that freshly churned butter is more stable than butter which has been in storage. Also, butter in caramels kept better than in the butter creams tested.

**Saving Nutrients in Celery.** Nutritionists at the Utah Experiment Station urge full use of celery and warn against throwing away the outside leaves and stalks, which contain more vitamin A and ascorbic acid than the tender inside leaves and stalks. Although celery is not relatively high in nutritive value as compared to many other vegetables, it can contribute more nutrients if the whole bunch, leaves included, is used. Eating it raw is of special advantage, but to get the most value from celery, both in flavor and nutritive value, housewives should make full use of the leaves. Tender inner leaves may be eaten with the stalk or cut up in salad, while the outer, less tender leaves and stalks may be cooked in a small amount of water until just tender, then served with a white sauce containing a little cheese. They can also be used in stuffing for poultry or in soup or other cooked dishes.

Recent tests of the green, unblanched Pascal celery, which was raised first in Utah and is now produced in a number of other states, indicate that it contains considerably more carotene than white, self-blanching celery.

**Frozen Food Locker Plant Census.** The number of frozen food locker plants in the U. S., as of January, 1950, had almost doubled since 1945, the U.S.D.A. reports; today 11,400 plants serve about 15 million people and process 1.3 billion lb. food annually. The survey, however, showed a drop of 16 per cent in the average number of lockers rented and in the average volume of food processed per plant. Rental prices have mounted steadily, rising from $9.80 in 1941 to $13.00 in 1950. Rates for cutting, wrapping, freezing, and grinding services averaged $3.28 per hundredweight in 1950, compared to $1.71 in 1942.

Of the plants reporting in the survey, 23 per cent offered slaughtering services for non-locker patrons; 22 per cent bought livestock to sell as meat; 24 per cent cured and smoked meat for sale; 27 per cent manufactured pork sausage for sale; 51 per cent sold commercially frozen foods; and 3 per cent manufactured ice cream for sale. The food processed by these plants included 87 per cent meat, 6 per cent fruits and vegetables; 4 per cent poultry; and 3 per cent game. About three-fourths of all locker plants are still located in towns of 5000 or less, with 40 per cent in towns under 1000 population.

**THANK YOU, LADIES & GENTLEMEN!**

**Prolon Ware...** THE NEW MELMAC*

TABLEWARE WITH THE "PROLON GLAZE"

**THE VOLUME OF PROLON WARE PURCHASES** placed throughout the country by wholesalers, institutions, hotels and restaurants has been gratifying proof that you appreciate the many points of superiority we have incorporated into this new line of tableware. We are happy, and grateful, that you have shown such marked and instant approval of Prolon Ware's balanced design, its outstanding "Prolon Glaze," and its range of 17 items in a choice of four pleasant colors.

*Reg. trade-mark, Amer. Cyanamid Co.

Prolon Ware... a product of PROLON PLASTICS, a division of

PRO-PHY-LAC-TIC BRUSH COMPANY FLORENCE, MASS.

MOLDERS OF FINE PLASTICS SINCE 1844

NATIONAL DISTRIBUTOR, Parker D. Perry, Incorporated, 729 Boylston Street, Boston, Mass.

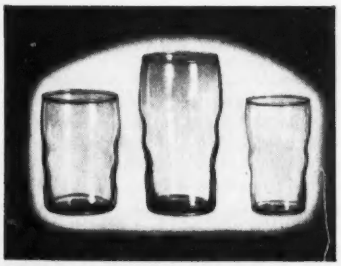
## *News of State Associations*

**Arizona Dietetic Association.** The election of officers of the Arizona Dietetic Association for 1950–51 was held at the December 2 meeting at Cudia City. They are as follows: President: Dorothy Taylor, Chief Dietitian, Tucson Veterans Administration Hospital; President-Elect, Norma Sayre, North Phoenix High School; Secretary, Frances MacRae, Tucson Veterans Administration Hospital; and Treasurer, Betty Jane Monroe, Dietitian, College Dining Hall, University of Arizona, Tucson.

Speakers at the meeting included Dr. Arthur Kemmerer, Nutrition Chemist and Head of the Department of Nutrition, University of Arizona, whose topic was "Western Regional Nutrition Status Project—A Review of Findings in Arizona, Oregon, and California," and Ruth Marcondes, Arizona State College, Tempe, who spoke on "School Lunch Problems in Brazil."

**California Dietetic Association.** At the convention of the California Dietetic Association held in Fresno on November 18, 1950, the silver anniversary of the organization was celebrated at the banquet held at the Hotel Californian. At the speakers table were ten charter members. Helen B. Anderson, first President of the organization, was made Honorary President and was presented with a token gavel in appreciation of her active participation in the Association. Barbara Reid Robson, Shirley Engle Grembau, and Alvina Misch Hansen told of the development of the state organization in the northern and southern sections. Elizabeth Hayward told of the beginnings of the "Compilation of Diets." A comparison of the various problems of dietitians and the work twenty-five years ago and now was given by the other charter members.

At this meeting, it was decided that



**3 double-bulge** Heat-Treated tumblers offer a sure grip, even when wet: 9½ oz. (water), 12 oz. (iced tea), 5 oz. (juice).

**All Libbey Heat-Treated** tumblers have this special "H-T" marking—your assurance of 3-5 times longer-lasting glassware.

# TO COMFORT THE PATIENT... Cool beverages in a light-weight glass that's extra strong

Nothing comforts a trembling, feverish patient more than the sight of a cool, refreshing beverage. It is even more comforting if the beverage is in a light-weight tumbler that is easy to grip.

All Libbey Heat-Treated tumblers have light-weight, thin sides and bottoms —give a cool, smooth feel that contributes much to the patient's sense of well-being. And at *no* sacrifice in strength and durability!... because Libbey Heat-Treated tumblers are specially processed after molding to stand up 3-5 times longer than ordinary tumblers in heavy hospital duty.

All Libbey Safedge tumblers have chip-resistant rims . . . at the spot where most tumblers chip first! *Safedge* means "safety" for staff and patients. It also means savings through lower cost, less breakage, smaller needed inventory . . . protected by the famous guarantee: "*A new glass if the rim of a Libbey 'Safedge' glass ever chips!*" Ask your supplier for samples and prices, or write direct to Libbey Glass, Toledo 1, Ohio.

LIBBEY GLASS

*ESTABLISHED 1818*

LIBBEY GLASS, Division of Owens-Illinois Glass Company, Toledo 1, Ohio

Libbey HEAT-TREATED

a News Letter would be more effective in keeping the members informed of the activities of the Association than the *Bulletin* which necessitated the support of advertisers and more elaborate printing.

Another interesting feature of the meeting was the formation of a *Central Valley Section*, with Fresno as its center. This section of the state was the organizational spot of the California Dietetic Association, but it had never formed a section.

The November meeting of the *Los Angeles Section* was held at the Queen of Angels Hospital. Dr. William Beck, Research Assistant, University of California at Los Angeles Medical School's Atomic Energy Project, spoke on "The Recent Advances in ACTH and Cortisone Therapy." He discussed the biologic aspects of the two hormones and the research that has been done. He emphasized that therapeutic effects have been demonstrated in the treatment of diseases, such as arthritis, eczema, and rheumatic fever, but so far the relief obtained has only been temporary, and the total effect of the hormones used over a period of time is still undetermined.

**Florida Dietetic Association.** The officers of 1950–51 of the Florida Dietetic Association are as follows: President, Marjorie Morrison, Florida Board of Health, Jacksonville; President-Elect, Vera Walker, Florida Board of Health, Jacksonville; Vice-President, Anna Mae Sikes, Florida State University, Tallahassee; Secretary, Anne H. Davis, Quincy; and Treasurer, Sarah S. Tweed, Pensacola.

**KNOX Gelatine Desserts**

**made with SUCARYL***

The development of SUCARYL, a non-bitter boilable sugar-replacement by Abbott Laboratories has made possible tasty, sugar-free desserts made from Knox Gelatine U.S.P. (85 per cent pure protein) in the patient's home.

These Knox recipes offer desserts which are as appetizing and satisfying to the patient's taste as those made with sugar, but completely non-fattening or blood-sugar-productive from the sweetening agent. Easy to make • Economical • Readily digested and provides another source of useful protein.

KNOX GELATINE-SUCARYL DESSERTS FOR THE NON-FAT AND DIABETIC DIET a brochure of sugar-free dessert recipes is available to you on request. Write KNOX GELATINE, Dept. JAD Johnstown, N. Y.

*Abbott Trade Mark for Cyclamate Sodium

KNOX Gelatine U.S.P.

ALL PROTEIN NO SUGAR


**Georgia Dietetic Association.** This year's officers of the Georgia Dietetic Association are: President, Gertrude McDonald, Lawson Veterans Administration Hospital, Chamblee; President-Elect, Nell Wier, St. Joseph's Hospital, Savannah; Secretary, Priscilla Reynolds, Grady Hospital, Atlanta; and Treasurer, May Bess Cone, Emory University Hospital, Emory University.

**Indiana Dietetic Association.** The newly elected officers of the Indiana Dietetic Association for the 1950–51 term are: President, Kathryn Sheedy, Lilly Laboratory for Clinical Research, Indianapolis; President-Elect, Fern Brown, Reid Hospital, Richmond; Secretary, Marian Jones, State Board of Health, Indianapolis; and Treasurer, Bettye Poppenseaker, Indiana University Medical Center, Indianapolis. The Section Chairmen are as follows: Food Administration, Susan Finkbine; Community Nutrition, Margaret Dunham; Diet Therapy, Louise Irwin; and Professional Education and Vocational Guidance, Rose Bagnoli.

The fall meeting of the Indiana Dietetic Association was held at Indiana University, Bloomington, October 26. The program included a tour of Men's Quadrangle and dinner in the Union Building. Professor Lawrence Wheeler, Director of Communications, Indiana University, discussed "Curious Wills and Trust." The meeting was attended by fifty-three members of the Association.

**Iowa Dietetic Association.** The officers of the *Ames Dietetic Association* for 1950–51 are: President, Jean Donaldson; Vice-President, Carolyn Cason; and Secretary-Treasurer, Mary Terry. In November students majoring in dietetics, institution management, nutrition, and experimental foods at Iowa State College, were entertained. Lillian Storms Coover, President, The American Dietetic Association, discussed some factors to consider when selecting an internship.

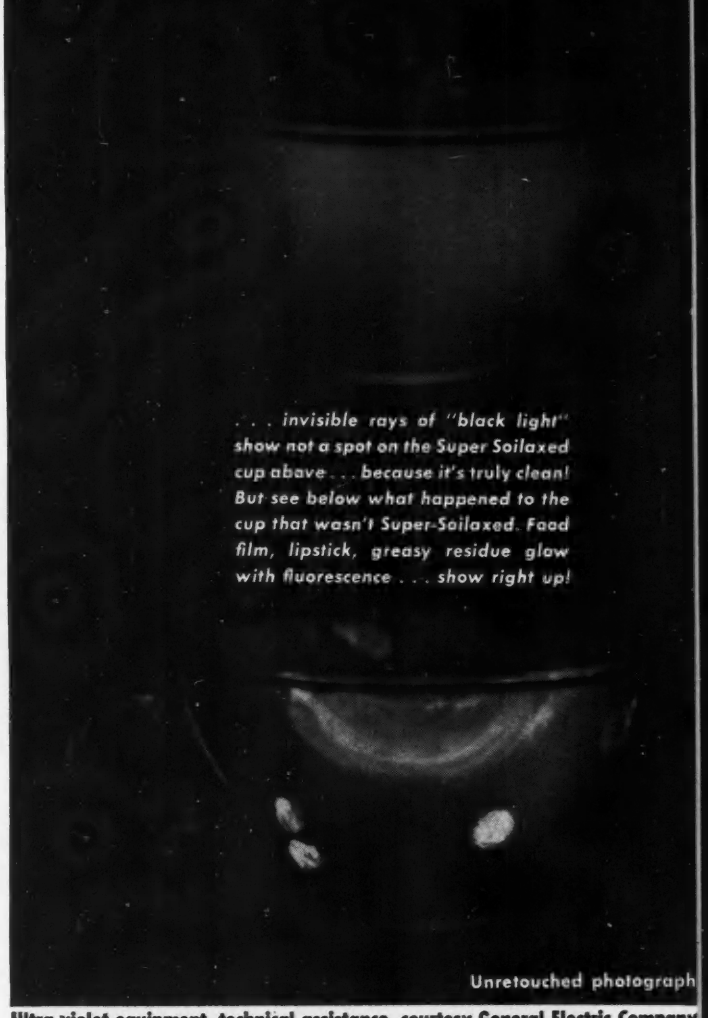
The *Des Moines Dietetic Association* met on December 4 at the Lutheran Hospital Nurses' Home. The Association accepted the project of the 1951 State Fair Exhibit. New officers are: President, Mildred Torrance, Mercy Hospital; President-Elect, Ruth M. Chapman, Chief Dietetian, Veterans Administration Hospital; Secretary, Claire Donahue, Younkers Brothers Bake Shop; and Treasurer, Betty Johnson, Methodist Hospital.

**Kansas Dietetic Association.** Section chairmen appointed for 1950–51 are as follows: Food Administration, Grace Scholz, Winter Veterans Administration Hospital, Topeka; and Diet Therapy, Elvira Henderson, Wichita Clinic.

*Wichita Dietetic Association.* Uniform diets have been made possible in Wichita by the use of the "Diet Manual" prepared by the Wichita Dietetic Association. All hospitals have the manual in Kardex form. The Sedgwick County Medical Association is financing its publication so that a copy can be placed in

# SPOTS THAT SHINE IN THE DARK...

*Here are two identical cups which have been washed, one in Super Soilax (above), the other in an ordinary washing compound (below). Both—to the naked eye—are equally clean. But—the lights go out and . . .*



*. . . invisible rays of "black light" show not a spot on the Super Soilaxed cup above . . . because it's truly clean! But see below what happened to the cup that wasn't Super-Soilaxed. Food film, lipstick, greasy residue glow with fluorescence . . . show right up!*

Unretouched photograph

**Ultra-violet equipment, technical assistance, courtesy General Electric Company**

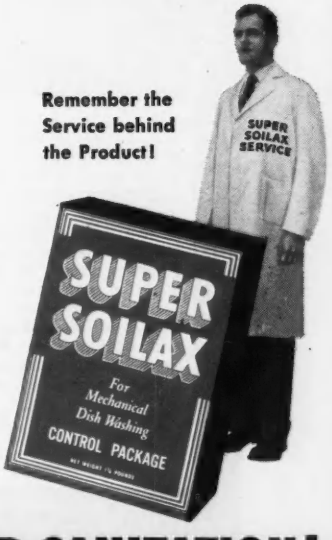
# Proof why the SUPER-SOILAXED cup is the SANITARY cup!

You need never make the dramatic "black light" test to assure yourself that your tableware is really *sanitary* clean! Just use Super Soilax in all your dishwashing operations, and you can have complete confidence in the immaculate cleanness of every single piece!

When you use Super Soilax, tableware comes gleaming from the machine. Super Soilax removes and floats away all grease and food soil. It prevents precipitation of film-forming elements that cloud glasses, film china, dull silver! Give your guests the benefit of super-clean tableware! Get the facts about the really cleansing properties of Super Soilax! Call your Soilax Serviceman today—or write for your free copy of "Dishwashing Dividends!"

**ECONOMICS LABORATORY, INC., ST. PAUL, MINN.** EL
***Also manufacturers of* TETROX *for manual dishwashing, and* PAN DANDY—*new, activated pot and pan washing compound.***

**Remember the Service behind the Product!**




## BY EVERY TEST—IT'S SUPER SOILAX FOR SUPER SANITATION!

every doctor's office. A group of new officers have been elected by the Wichita Association. Sister Martha, St. Francis Hospital, was elected President; Elvira Henderson, Wichita Clinic, was chosen Secretary-Treasurer; Marie Lies, St. Joseph's Hospital, is Vice-President.

*Kaw Valley Dietetic Association.* At the September meeting, dietetic students presented a round-table on their summer experiences. In October, Leinkemper Fulbright, exchange professor of the University of the Philippines, talked on her experiences there. In November the five members attending the American Dietetic Association convention in Washington gave reports. A change made in the executive board took place when Dorothy Swearingen was elected President of the Kaw Valley Dietetic Association to replace Catherine Marsh who moved to New York. Other officers are: Vice-President, Ada May Ridgway; and Secretary, Elva Frazier. All three are on the faculty at Kansas State College.

*The Greater Kansas City Dietetic Association.* The Greater Kansas City Dietetic Association was accepted as a member of the Technical Societies Council of the Kansas City Area. The two representatives to the Council are the Association's President, Monica Farrell Cameron, General Hospital, and Mary Breed, University of Kansas Medical Center.

**Maine Dietetic Association.** Officers this year of the Maine Dietetic Association are: President, Caroline Wright Lovejoy, Bangor Hydro Electric Company, Bangor; Secretary, Mary A. Ross, Maine Department of Health and Welfare, Augusta; and Treasurer, Wanda Zendzian, Veterans Administration Hospital, Togus.

**Maryland Dietetic Association.** The December meeting of the Maryland Dietetic Association included a demonstration of "Christmas Confections" by Ruth Ellen Hall. The following are the elected officers for 1950–51 of the Maryland Dietetic Association: President, Kathren B. Shull, Baltimore; President-Elect, Eleanor L. McKnight, Baltimore Health Department; Vice-President, Jane Hartman, Maryland Health Department, Baltimore; Secretary, Margaret Crawford, Baltimore; and Treasurer, Colleen Cox Hambleton, Deer's Head State Hospital, Salisbury. Section chairmen are: Community Nutrition, Helen M. Shaw, Sinai Hospital, Baltimore; Diet Therapy, Elaine Laursen, Johns Hopkins Hospital, Baltimore; Food Administration, Jane Hartman; and Professional Education, Mary C. Heltzel, St. Agnes Hospital, Baltimore.

**Michigan Dietetic Association.** This year's officers of the Michigan Dietetic Association are: President, Sarah C. Campbell, Leila Hospital, Battle Creek; President-Elect, Edna Mae McIntosh, Gerber Products Company, Fremont; Secretary, Marqueta Huyck, Wayne University, Detroit; and Treasurer, Doris Smith, Department of Foods and Nutrition, Michigan State College, East Lansing.

**New York State Dietetic Association.** The executive board for 1950–51 has the following members: President, Helen C. Hamilton, Corn Products Refining Company, New York City; President-Elect, Elizabeth Henry, Visiting Nurses Association, Rochester; Vice-President, Genevieve Coon, Albany Hospital, Albany; Secretary, A. June Bricker, Metropolitan Life Insurance Company, New York City; and Treasurer, Dorothy Kinnear, Presbyterian Hospital, New York City.

*Buffalo Dietetic Association.* The September dinner meeting, held at Polish Village with an attendance of thirty members, was an adventure in new foods. In October, the meeting took the form of career day for high school students.

**North Carolina Dietetic Association.** The following officers were elected in November to serve the North Carolina Dietetic Association in 1950–51: President, Virginia Newman, Presbyterian Hospital, Charlotte; President-Elect, Jane Umstead, Nutrition Director, Dairy Council of High Point and Greensboro, Greensboro; Vice-President, Mary B. Deaver, Nutrition Division, North Carolina State Board of Health, Raleigh; Secretary, Mary A. Anderson, Charlotte Memorial Hospital, Charlotte; and Treasurer, Elizabeth Yearick, Duke University Hospital, Durham.

Wally-J Sandwich Shop
Chanin Bldg., 125 East 41st St., New York
Says
JOHN SCHROTT
PRESIDENT
"This Boontonware Dinner Plate has been in service in my restaurant for 3 years"
"We made a complete installation of Boontonware three years ago.
Since then, it has been used to serve about 1000 meals per day.
90% of the original Boontonware is still in use. The over-all installation has saved us about $5000 per year. We have never made a better investment in our 27 years of restaurant business.
We consider Boontonware the best and most efficient Melmac dinnerware in the field and are glad to give it our unqualified endorsement."
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At leading Restaurant, Hotel, or Hospital Supply Dealers
Boontonware
Fine Dinnerware Fashioned of MELMAC®
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# All Children Can Benefit from *this Hot Drink at Breakfast*

The problem of encouraging children to eat an adequate breakfast finds easier solution when Ovaltine in hot milk is recommended as a breakfast beverage. Many children clamor for a hot drink at the morning meal and Hot Ovaltine is the right kind of drink to recommend.

A cup of Hot Ovaltine makes an excellent contribution of virtually all essential nutrients, adding substantially to the nutritional start for the day. It also serves in a gustatory capacity by enhancing the appeal of breakfast and making other foods more inviting.

The nutrient contribution made by a cup of Ovaltine is apparent from the table below. Note the wealth of essentials added to the nutritional intake by making the simple recommendation of adding a cup of Hot Ovaltine to the child's breakfast.

**THE WANDER COMPANY, 360 NORTH MICHIGAN AVE., CHICAGO 1, ILLINOIS**

*Ovaltine*

**Here are the nutrients that a cupful of hot Ovaltine, made of ½ oz. of Ovaltine and 8 fl. oz. of whole milk,* provides:**

| | | | | | |
|---|---|---|---|---|---|
| PROTEIN | 10.5 Gm. | IRON | 4 mg. | NIACIN | 2.3 mg. |
| FAT | 10.5 Gm. | COPPER | 0.2 mg. | VITAMIN C | 10 mg. |
| CARBOHYDRATE | 22 Gm. | VITAMIN A | 1000 I.U. | VITAMIN D | 140 I.U. |
| CALCIUM | 370 mg. | VITAMIN $B_1$ | 0.39 mg. | CALORIES | 225 |
| PHOSPHORUS | 315 mg. | RIBOFLAVIN | 0.7 mg. | | |

*Based on average reported values for milk.

**Ohio Dietetic Association.** The Executive Board of the Ohio Dietetic Association voted on September 23, to establish a scholarship of at least $200 or multiples thereof to be given annually to an Ohio graduate or graduates with a major in foods and nutrition or dietetics from an accredited school or college. The scholarship is to be used to help students financially who wish to take an internship.

**Oklahoma Dietetic Association.** On September 26, the members of the *Tulsa Dietetic Association* were featured on a nightly television show "Lookin' at Cookin'." Kathleen Atha, Home Service Director with the Oklahoma Natural Gas Company, appears weekly on the show. The theme, "A Parade of Foods" acquainted the areas reached by the Tulsa television station with some of the dietitians serving the city and helped further public relations for the dietetic profession.

**South Carolina Dietetic Association.** Officers for the year for the South Carolina Dietetic Association are: President, Anna Long Watson, Columbia; President-Elect, Frances Eddy, Charleston County Health Department, Charleston; Secretary, Margaret Freeman, South Carolina Board of Health, Columbia; and Treasurer, Mary Jane Larabee, Columbia Hospital, Columbia.

**Tennessee Dietetic Association.** Officers of the Tennessee Dietetic Association for this year are: President, Frances Crain, Memphis Dairy Council; President-Elect, Annie Galbraith, East Tennessee Baptist Hospital, Knoxville; Vice-President, Bernice Hopkins, Vanderbilt University Hospital, Nashville; and Secretary-Treasurer, Edith Graham, Kennedy Veterans Administration Hospital, Memphis. The following are the section chairmen: Community Nutrition, Joyce Gary, Jackson-Madison County Hospital, Jackson; Diet Therapy, Flora Stephens, Kennedy Veterans Administration Hospital, Memphis; and Professional Education, Moiselle Peay, Nashville.

The annual meeting of the Tennessee Dietetic Association was held in Nashville, November 17 to 19. This was the first joint meeting to be held with the Tennessee Home Economics Association. Speakers included Dr. E. Neige Todhunter, Head, Department of Foods and Nutrition, University of Alabama, whose topic was "Food and Human Progress," and Mrs. W. M. McCallum, who talked about the Midcentury White House Conference on Children and Youth.

The Tennessee dietitians this year have been promoting public relations and vocational guidance quite effectively. In Memphis, at the request of the Ninth District Dental Society, the Memphis Dietetic Association provided a nutrition consultant at the Dental Mobile Units at the Mid-South Fair. This exhibit was set up as part of a public health exhibit, and provided free dental X-rays to all children under sixteen. While parents waited for their children, the nutritionist had an opportunity to tell them about food and nutrition for their children. Dietitians at Kennedy Veterans Administration Hospital also helped promote understanding of the profession by playing hostess to junior and senior high school pupils and students from the Memphis State College. Vocational guidance literature has been extensively distributed to schools and at three fairs. In addition, special programs were presented at Cookeville and Jackson.

**Vermont Dietetic Association.** The newly elected officers for the 1950–51 term are as follows: President, Theodora Wakefield Mattison; President-Elect, Ruth Gorham Rohde; and Secretary, Helen M. DeVoid. The annual meeting of Vermont Dietetic Association was held on December 9 at the Mary Fletcher Hospital, Burlington. Pauline Westcott, a home economics student at the University of Vermont, showed colored slides of Switzerland taken on a trip this summer for which she was chosen by the Vermont Extension Service to serve as its representative.

**Virginia Dietetic Association.** Officers of the year for the Virginia Dietetic Association are: President, Elizabeth Woodard, St. Elizabeth's Hospital, Richmond; President-Elect, Elizabeth Lounds, Medical College of Virginia, Richmond; Secretary, Edna Cates, Johnston-Willis Hospital, Richmond; and Treasurer, Dorothy Perkinson, McGuire Veterans Administration Hospital, Richmond.

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FASTER
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STEAM COOKERS
You can serve hot, fresh, appetizing meals in *less* time and with *less* work when you cook with Market Forge Steam Cookers. Food is *tastier.* Cooking is *faster.* Waste and shrinkage is cut. Steam cooking saves you time and labor because it eliminates washing heavy pots and pans. There is never any burned food.
Cook the kind of food that *keeps customers coming back.* Cook with Market Forge Steam Cookers. Get these advantages:
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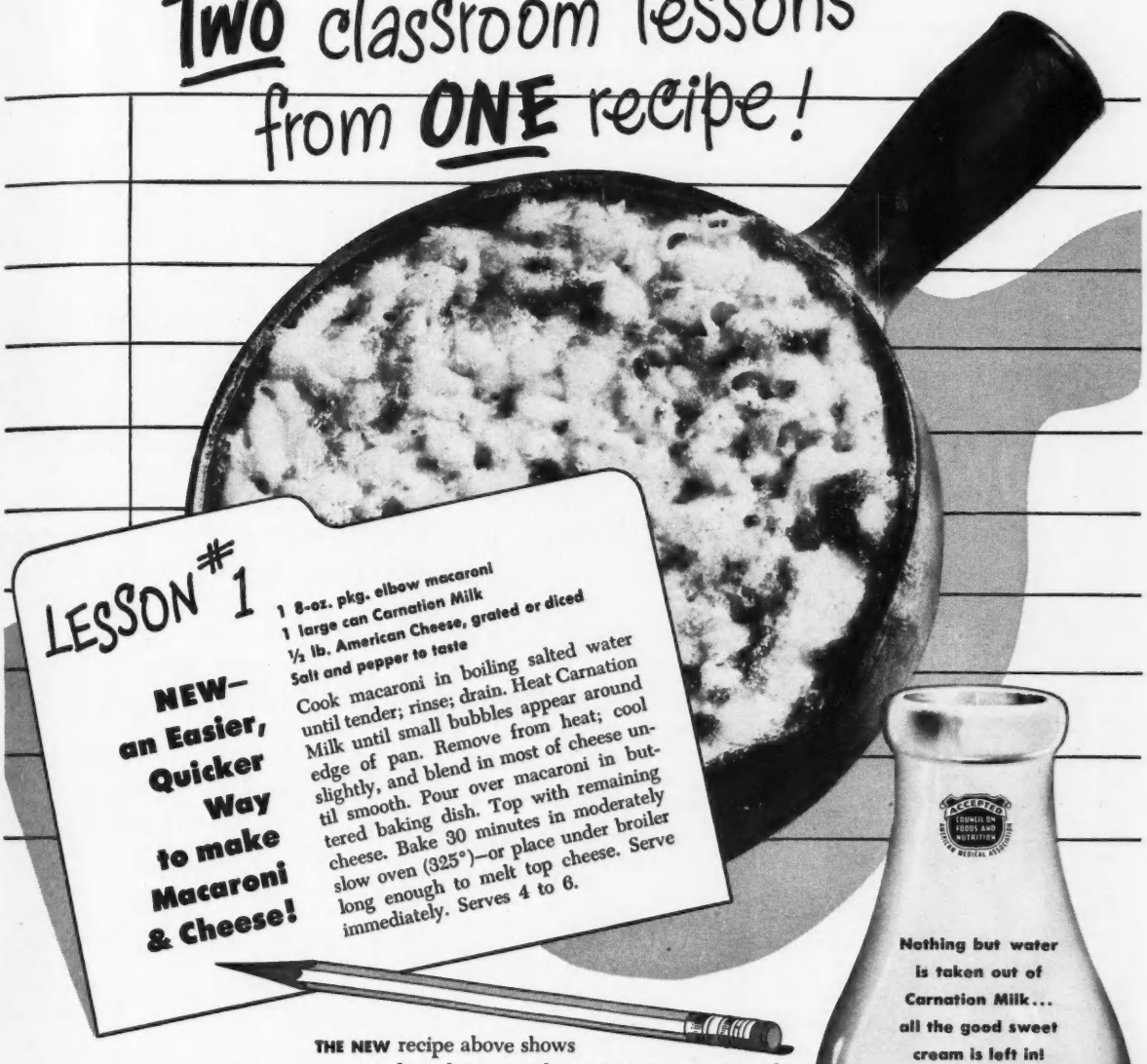
# Two classroom lessons from ONE recipe!



## LESSON #1

**NEW— an Easier, Quicker Way to make Macaroni & Cheese!**

**1 8-oz. pkg. elbow macaroni**
**1 large can Carnation Milk**
**½ lb. American Cheese, grated or diced**
**Salt and pepper to taste**

Cook macaroni in boiling salted water until tender; rinse; drain. Heat Carnation Milk until small bubbles appear around edge of pan. Remove from heat; cool slightly, and blend in most of cheese until smooth. Pour over macaroni in buttered baking dish. Top with remaining cheese. Bake 30 minutes in moderately slow oven (325°)—or place under broiler long enough to melt top cheese. Serve immediately. Serves 4 to 6.

## LESSON #2

**How to Cut Your Milk Bill by a Third!**

**THE NEW** recipe above shows your students how to make *creamier* macaroni and cheese... and is a wonderful demonstration of how they can regularly save up to one-third on their milk bill by using Carnation Evaporated Milk.

No special recipes are needed to use Carnation instead of expensive bottled milk and cream. For most cream purposes... including whipped toppings... leave Carnation undiluted, just as it pours from the can. Millions of people like Carnation *better* than cream in their coffee— yet it costs less than half as much!

In any recipe that calls for milk, just mix Carnation with an equal amount of water. Even then, Carnation is still richer than *any* State Standard for bottled milk. And in most states, Carnation costs only about two-thirds as much as regular Grade A milk!

So cut your school budget by using Carnation in your classroom demonstrations... and at the same time teach your students to be thrifty homemakers!

**FREE!** Special new Home Service Bulletins, and famous "Velvet Blend" Recipe Book for use in your classroom. Carnation Co., Dept. C-21, Los Angeles 36, California.

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COUNCIL ON FOODS AND NUTRITION
AMERICAN MEDICAL ASSOCIATION
Nothing but water is taken out of Carnation Milk... all the good sweet cream is left in!
Carnation
EVAPORATED
MILK
VITAMIN D INCREASED HOMOGENIZED

"from Contented Cows"

**Washington State Dietetic Association.** A joint project of the Professional Education and Food Administration Sections of the Washington State Dietetic Association this year will be the conducting of an institute for food service supervisors and workers in social agencies with institutional programs. Topics which will be discussed include: tray service, time and motion studies, sanitation, general appearance and grooming, human relationships, and food preparation and cooking. The Diet Therapy Section this year plans to (a) promote the use and acceptance of a standard method of teaching the diabetic diet; (b) work out a practical application of the low-cholesterol diet; and (c) prepare a handbook on low-sodium diets.

The Washington State Dietetic Association has begun a Ruth E. Forsberg Memorial Fund, in recognition of her professional work and inspiration to students. Money from the fund will be used for loans to dietetic interns.

Officers for 1950–51 of the Washington State Association are: President, Eudora Fulkerson, Tacoma General Hospital, Tacoma; President-Elect, Juanita Kahler, Washington State College, Pullman; Secretary, Elisabeth Williams, Seattle; and Treasurer, Mary Louise Johnson, University of Washington. Section chairmen are: Community Nutrition, Beth Gannon, Nutritionist, University Child Health Center, Seattle; Diet Therapy, June Pettibone, Mason Clinic, Seattle; Food Administration, Doris Williams, U. S. Marine Hospital, Seattle; and Professional Education, Alice Thomas, Seattle College.

The *Seattle Dietetic Association* met in January at the Virginia Mason Hospital for a program on "What's Doing with School Lunch." In February, the meeting emphasized hospital dietetics.

*Spokane* dietitians met in December at the new Veterans Administration Hospital to organize a new local dietetic association, with a membership of about twenty. The program for the evening consisted of a talk by Louise Killian, consultant on equipment in New York City, whose topic was "Equipment and the Importance of Having an Organized Association." Juanita Kahler, President-Elect of the Washington State Dietetic Association, attended the meeting to assist in the organization of the group.

**West Virginia Dietetic Association.** Officers for the West Virginia Dietetic Association are: President, Marian McKenzie, Fairmont General Hospital, Fairmont; President-Elect, Elizabeth Anderson, St. Luke's Hospital, Bluefield; Secretary, Ruth Mathews Mitchell, Myers Clinic, Philippi; and Treasurer, Mildred Kent, Ohio Valley General Hospital, Wheeling.

How to make your Blodgett do DOUBLE DUTY
BAKES HERE
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Keep this Two-in-One Kitchen Tool busy and it will pay you double dividends. It is scientifically engineered to handle all baking and roasting operations. Sections are separately fired and controlled to supply the exact temperatures for each type of food. While one deck turns out quality controlled baked goods, another deck roasts your meats at LOW TEMPERATURE, retaining the juices, lessening meat shrinkage. Hot breads and pies etc. are done when your roasts are, ready to serve oven-fresh, thus coordinating meal-production.
Blodgett makes ovens from its "Basic Three" design which provides the units to make 24 models.
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## *Association Activities*

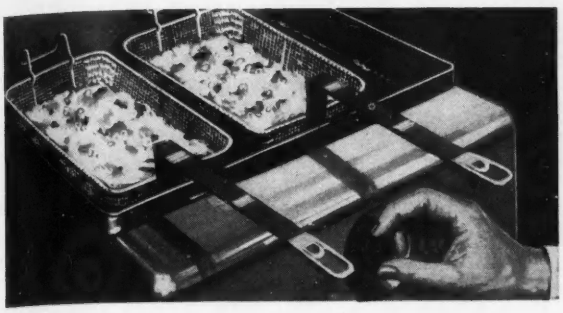
**National Urban League.** A nationwide Vocational Opportunity Campaign is to be held by the National Urban League, March 11 to 18. A.D.A. is cooperating in two ways. Samples of our vocational literature have been supplied to the Urban League for inclusion in a "Vocational Opportunity Kit" which was distributed late in January to some six hundred schools and agencies. In addition, we have suggested the names of A.D.A. members in various sections of the country who might serve as "Career Guides" in connection with this program.

**Publicity in Air Bulletin.** The *Air Bulletin*, a publication of the Department of State, distributed to the press and radio representatives of some sixty nations for re-publication overseas, is part of our government's current "Campaign of Truth" program. An article entitled "Women Dietitians" appeared in the November 3, 1950 issue (Vol. 4, No. 74). The activities of our recent Washington convention were described, and information was included on the profession and our Association.

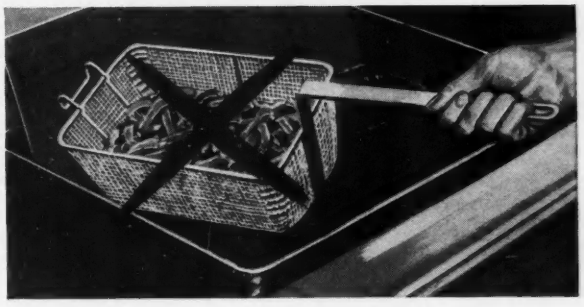
**Conference on FAO.** A called meeting of representatives of the National Conference of Nongovernmental Organizations on FAO (Food and Agriculture Organization) was held in Washington, D. C., January 8. Anne Stewart Miller attended for A.D.A.

**Association Meetings.** The A.D.A. *Library Committee* met on January 5 to continue their project of reviewing material now in our library. This work is being done in preparation for developing a cataloging system. The committee consists of Ellen Thomsen, A. Elizabeth Whitney, and Elizabeth Tuft, Chairman —all of Chicago.

# NO SMOKING?

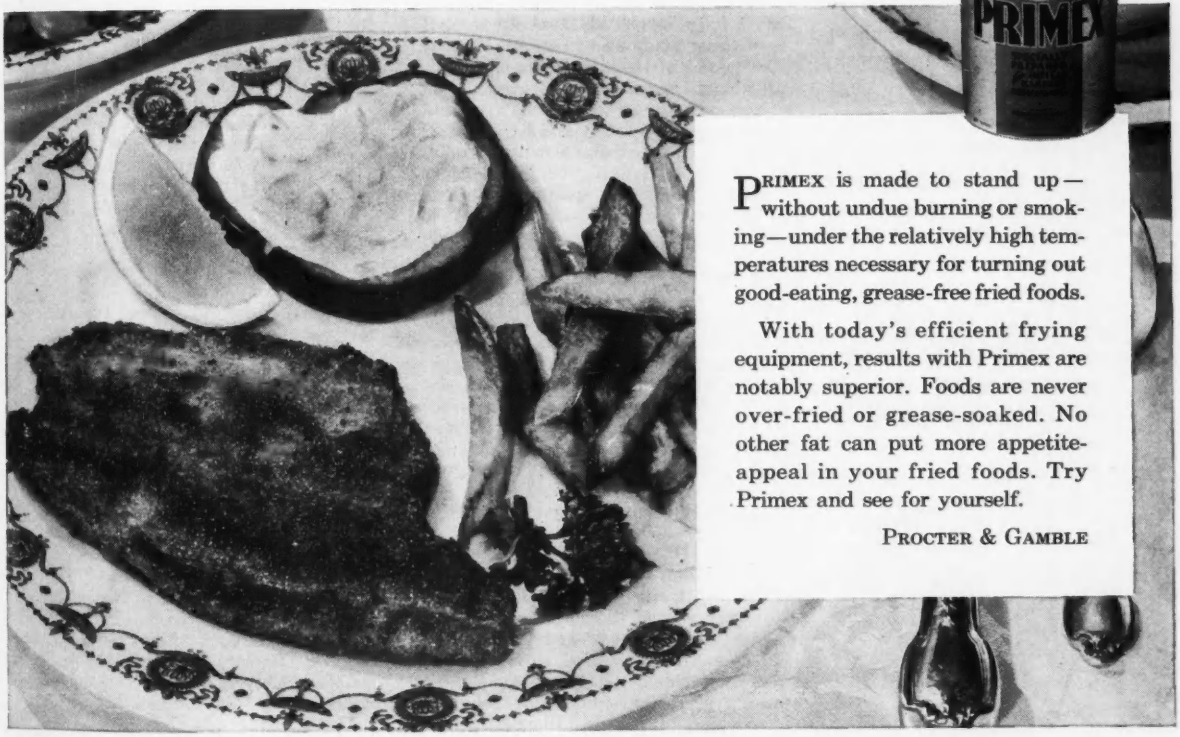


*If you hold your frying temperatures low, you'll minimize the danger of having your fat burn or smoke excessively . . . BUT—*



*When you drop temperatures too low, you're bound to get unappetizing, grease-soaked fried foods!*

## The Answer: USE PRIMEX!




PRIMEX is made to stand up—without undue burning or smoking—under the relatively high temperatures necessary for turning out good-eating, grease-free fried foods.

With today's efficient frying equipment, results with Primex are notably superior. Foods are never over-fried or grease-soaked. No other fat can put more appetite-appeal in your fried foods. Try Primex and see for yourself.

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**ALL-VEGETABLE . . . ALL-HYDROGENATED**

**The "Long Frying Life" Fat**

Wonderful in Winter...

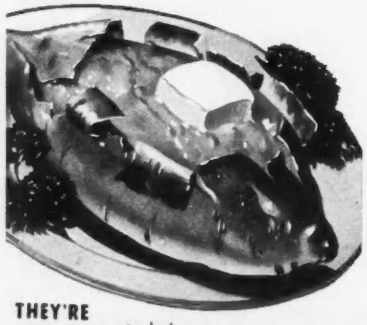
Spark your winter menus with Louisiana Golden Yams, the superb energy food.

Get the *extra* bounce of *extra* Vitamin A—plus the finer flavor and tremendous eye-appeal of these sugary, moist sweet potatoes.

Those you serve will appreciate that lingering, deep-down satisfaction a meal with Louisiana Yams *always* gives.

They just naturally go with wintertime!

LOUISIANA GOLDEN YAMS



THEY'RE Sun-ergized

The *By-Laws Committee of the House of Delegates* met at the A.D.A. office on January 9. Those attending were Charlotte Ludwig, Elizabeth Tuft, and Beulah Hunzicker, Chairman.

The *Executive Board* of the Association will meet at the national office February 21 to 24. The Finance Committee will hold its meeting on February 22, and the Coordinating Cabinet will meet February 23.

## News of Advertisers

The *Borden Company* has recently revamped its packaging of Starlac nonfat dry milk solids. A moistureproof, siftproof carton liner of plastic laminated to a greaseproof paper now protects the Starlac from absorbing moisture and becoming lumpy.

*Bernard Foods Industries, Inc.*, have recently developed five new soups and consommés which show 0.8 to 5.0 mg. sodium per 4-oz. serving. The tests were made in an independent laboratory and in a state university laboratory. The content of sodium as found by two tests made with the flame photometer conclusively indicates the truthfulness of the manufacturers' claims. To maintain the flavor of the soups without adding sodium, a specially prepared hydrolysized protein derivative is used.

A new flavor of quick fudge mix—coconut—has been made available by *"Junket" Brand Foods Division, Chr. Hansen's Laboratory, Inc.* The company also markets chocolate and penuche quick fudge mixes. All three can be used in making candy and frostings. Recipes for the use of these products are available from the company.

*Abbott Laboratories* now has available Sucaryl in both tablet and liquid form. The liquid form, available in drug stores, as is the tablet form, has been named "Sucaryl Sweetening Solution." Sucaryl is a non-caloric sweetening agent which can be used in cooking, baking, and canning without loss of sweetness. It can be used by diabetic patients and persons on reducing or other sugar-restricted diets. Sucaryl, when used in household quantities, leaves no bitter or metallic after-taste characteristic of saccharin, and does not decompose in heat required for cooking. Because of its sodium content, it may be contraindicated for persons on restricted sodium diets. Recipes using Sucaryl are available from Abbott Laboratories.

The fiftieth anniversary of Snowdrift shortening was celebrated in November by *Wesson Oil and Snowdrift Sales Company* in New Orleans. The introduction of Snowdrift fifty years ago marked the real beginning of the cottonseed oil industry, and today cottonseed oil is used almost entirely as a food, with its most important single use being the manufacture of quality shortening. In the intervening fifty years, Snowdrift has won a number of prizes and the company has added to its line the "heavy-duty" MFB, Quik-Blend, and Wesson oil. It is today continuing to expand. In February the first buildings of a new Chicago plant are expected to be completed.

The *Fleischmann Division of Standard Brands Inc.* has prepared a revised edition of its product booklet, "Standard Brands' Part in Serving Good Food in Hotels, Restaurants and Institutions." In it is included new and additional information with emphasis on how to use the company's products. One chapter deals with "The Fundamentals of Coffee Brewing"; another discusses "Methods of Making and Serving Tea." Eight detailed formulas are given for using Fleischmann's margarine, as well as recipes for Stox and Royal desserts. Copies may be obtained from the Hotel and Restaurant Department of Standard Brands.

A new, door-type commercial dishwasher, known as Model "S," with vertical sliding doors, and a newly designed revolving wash and rinse spray unit has been announced by *Universal Dishwashing Machinery Company*. The new model has a rated capacity of 2000 dishes an hour. It is equipped with a high-power revolving mechanism for wash and rinse above and below the racks, which creates a water pattern that is effective in cleaning dishes, glasses, cups, and silverware, due to penetrating scrubbing action. There are three doors for straight-through or corner operation, which can be changed easily for either direction of feed. All three doors are locked in position during wash and rinse operations by an interlocking door control system. A steam injector is optional equipment. Gas burners, steam coils, or electric heat can be furnished.

*Cereal Institute, Inc.*, has two new kits of teaching materials. The first includes a wall poster, "100 Tempting Foods for Good Breakfasts"; a notebook-size sheet which repeats the information on the poster and in addition gives a form for planning breakfast menus; and a new booklet by Amy I. Bloye, Purdue University, titled "How to Plan Better Breakfasts." The booklet is divided into five chapters: "The Importance of Planning Breakfast as a Meal," "How to Plan Better Breakfasts," "Planned Breakfasts Are Economical Meals," "Nutritional Value of Three Planned Breakfasts for Women and Girls," and "Plan Breakfast as a Family Meal." Charts of meal patterns and the wide variety of food available for breakfast are given, as well as information on seasonal and holiday menus, cost analysis, and nutritional evaluation of breakfasts. The second kit includes a poster on "Excellent Nutritional Supplementation—Cereal and Milk"; a notebook sheet, "How Do You Score on Breakfast Cereals?" and a booklet on "The Nutritional Contribution of Breakfast Cereals" which is to be used as the teacher's source book. Edited by Dr. Clara Mae Taylor, Teachers College, Columbia University, it includes chapters on "The Importance of Cereals," "Breakfast Cereal Generic Names and Descriptions," "The Nutritional Contribution of Breakfast Cereals," "Cereals and the Adequate Breakfast," and "Twelve Questions and Answers About Breakfast Cereals," as well as a bibliography.